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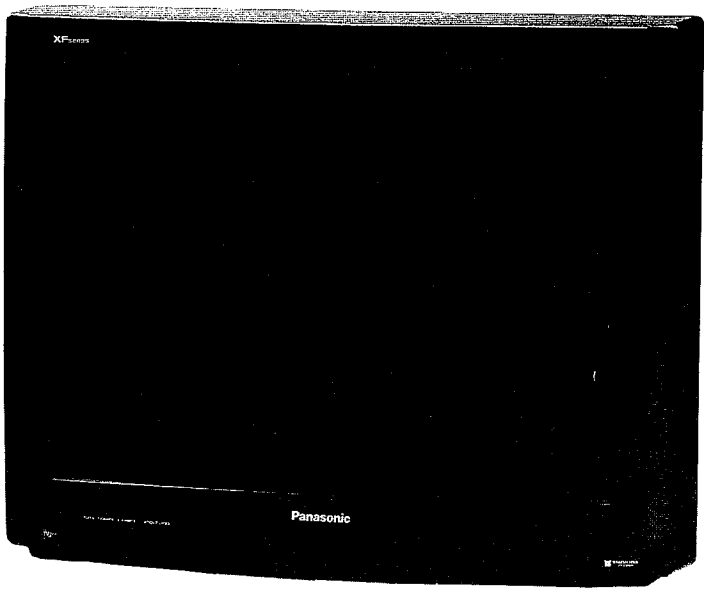
ORDER NO. MTC9906027C1
B5

Service Manual

Color Television



Main Manual
DX1D

Panasonic

Models	Chassis
CT-32XF56A	AP320
CT-32XF56CA	AP320

SPATIALIZER
3-D STEREO

This Service manual is issued as a service guide for the models of the **DX1D** family listed above. Included in this manual are a set of schematic, block diagrams, functional descriptions, alignment procedures, disassembly procedures, and a complete parts list.

"**WARNING!** This Service Manual is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. **Products powered by electricity should be serviced or repaired only by experienced professional technicians.** Any attempt to service or repair the product or products dealt with in this Service Manual by anyone else could result in serious injury or death."

The service technician is required to read and follow the "**Safety Precautions**" and "**Important Safety Notice**" in this Main Manual.

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Important Safety Notice

Special components are used in this television set which are important for safety. These parts are identified on the schematic diagram by the symbol ⚠ and printed in **BOLD TYPE** on the replacement part list. It is essential that these critical parts are replaced with the manufacturer's specified replacement part to prevent X-ray radiation, shock, fire or other hazards. Do not modify the original design without the manufacturer's permission.

Safety Precautions

General Guidelines

An **Isolation Transformer** should always be used during the servicing of a receiver whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect the Receiver from being damaged by accidental shorting that may occur during servicing.

When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always Replace Protective Devices, such as fishpaper, isolation resistors and capacitors, and shields after servicing the Receiver. Use only manufacturer's recommended rating for fuses, circuits breakers, etc.

High potentials are present when this Receiver is operating. Operation of the Receiver without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautions when servicing high-voltage equipment.

Extreme care should be practiced when **Handling the Picture Tube**. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, use safety goggles and heavy gloves for protection. **Discharge the picture tube** by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. dag ground lead) to the anode with a well insulated wire or use a grounding probe.

Avoid prolonged exposure at close range to unshielded areas of the picture tube to prevent exposure to X-ray radiation.

The **Test Picture Tube** used for servicing the chassis at the bench should incorporate safety glass and magnetic shielding. The safety glass provide shielding for the tube viewing area against X-ray radiation as well as implosion. The magnetic shield limits the X-ray radiation around the bell of the picture tube in addition to the restricting magnetic effects. When using a picture tube test jig for service, ensure that the jig is capable of handling **50.0kV** without causing X-ray radiation.

Before returning a serviced receiver to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. **Do not use a line isolation transformer when testing.**

Leakage Current Cold Check

Unplug the AC cord and connect a jumper between the two plug prongs.

Measure the resistance between the jumpered AC plug and expose metallic parts such as screwheads, antenna terminals, control shafts, etc. If the exposed metallic part has a return path to the chassis, the reading should be between 240kΩ and 5.2MΩ. If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

Leakage Current Hot Check (Fig. 1)

Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

Connect a 1.5kΩ 10 watt resistor in parallel with a 0.15µF capacitor between an exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other exposed metallic parts.

Verify that any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson Model 229, Sencore Model PR57 or equivalent) may be used in the above procedure, in which case any current measure must not exceed 1/2 milliamp. If any measurement is out of the specified limits, there is a possibility of a shock hazard and the Receiver must be repaired and rechecked before it is returned to the customer.

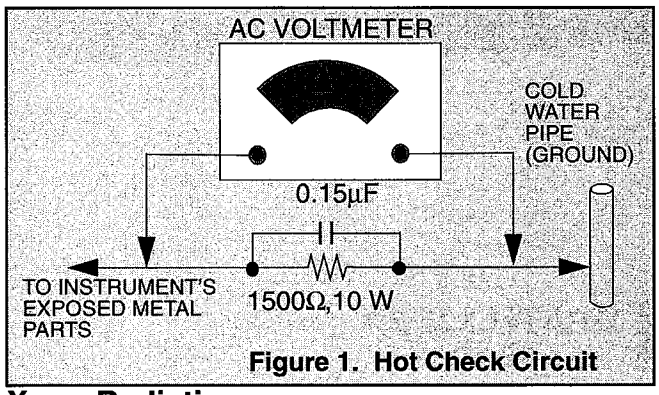

Figure 1. Hot Check Circuit

X-ray Radiation

WARNING: The potential source of X-ray radiation in the TV set is in the High Voltage section and the picture tube.

Note: *It is important to use an accurate, calibrated high voltage meter.*

Set the **brightness, picture, sharpness** and **color** controls to Minimum.

Measure the High Voltage. The high voltage should be **31.0kV ±1.0kV**. If the upper limit is out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of premature component failure.

Horizontal Oscillator Disable Circuit Test

This test must be performed as a final check before the Receiver is returned to the customer. See Horizontal **Oscillator Disable Circuit Procedure Check** in this manual.

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Service Notes

Note: ***These components are affixed with glue. Be careful not to break or damage any foil under the component or at the pins of the ICs when removing. Usually applying heat to the component for a short time while twisting with tweezers will break the component loose.***

Leadless Chip Component (surface mount)

Chip components must be replaced with identical chips due to critical foil track spacing. There are no holes in the board to mount standard transistors or diodes. Some chips capacitor or resistor board solder pads may have holes through the board, however the hole diameter limits standard resistor replacement to 1/8 watt. Standard capacitor may also be limited for the same reason. It is recommended that identical components be used.

Chip resistor have a three digit numerical resistance code - 1st and 2nd significant digits and a multiplier. Example: 162 = 1600 or 1.6kΩ resistor, 0 = 0Ω (jumper).

Chip capacitors generally do not have the value indicated on the capacitor. The color of the component indicates the general range of the capacitance.

Chip transistors are identified by a two letter code. The first letter indicates the type and the second letter, the grade of transistor.

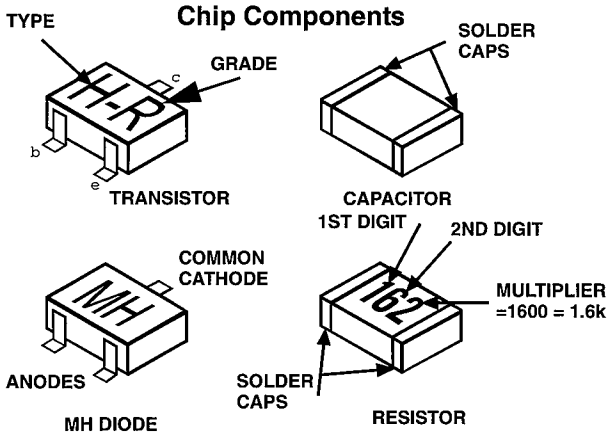
Chip diodes have a two letter identification code as per the code chart and are a dual diode pack with either common anode or common cathode. Check the parts list for correct diode number.

Component Removal

1. Use solder wick to remove solder from component end caps or terminal.
2. Without pulling up, carefully twist the component with tweezers to break the adhesive.
3. Do not reuse removed leadless or chip components since they are subject to stress fracture during removal.

Chip Component Installation

1. Put a small amount of solder on the board soldering pads.
2. Hold the chip component against the soldering pads with tweezers or with a miniature alligator clip and apply heat to the pad area with a 30 watt iron until solder flows. Do not apply heat for more than 3 seconds.

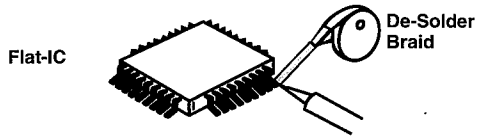


How to Replace Flat-IC

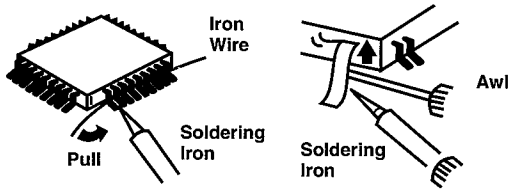
- Required Tools -

- Soldering iron
- De-solder braids
- Iron wire or small awl
- Magnifier

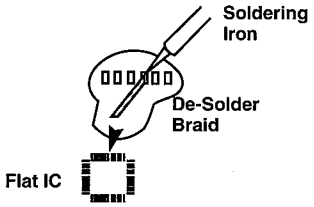
1. Remove the solder from all of the pins of a Flat-IC by using a de-solder braid.



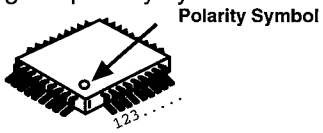
2. Put the iron wire under the pins of the Flat-IC and pull it in the direction indicated while heating the pins using a soldering iron. A small awl can be used instead of the iron wire.



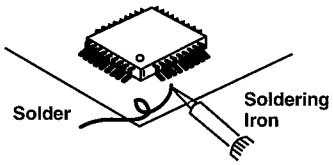
3. Remove the solder from all the pads of the Flat-IC by using a de-solder braid.



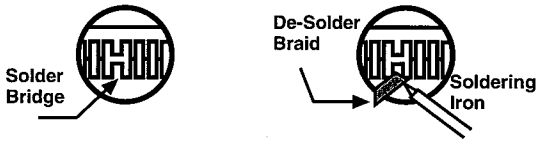
4. Position the new Flat-IC in place (apply the pins of the Flat-IC to the soldering pads where the pins need to be soldered). Properly determine the positions of the soldering pads and pins by correctly aligning the polarity symbol.



5. Solder all pins to the soldering pads using a fine tipped soldering iron.



6. Check with a magnifier for solder bridge between the pins or for dry joint between pins and soldering pads. To remove a solder bridge, use a de-solder braid as shown in the figure below.



Service Notes (Continued)

MPORTANT: To protect against possible damage to the solid state devices due to arcing or static discharge, make certain that all ground wires and CRT DAG wire are securely connected.

CAUTION: The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the Receiver to avoid damage to the test equipment or to the chassis. Connect the test equipment to the proper ground (⏚) or (⏚) **when servicing, or incorrect voltages will be measured.**

WARNING: This Receiver has been designed to meet or exceed applicable safety and X-ray radiation protection as specified by government agencies and independent testing laboratories.

To maintain original product safety design standards relative to X-ray radiation and shock and fire hazard, parts indicated with the symbol ⚠ on the schematic must be replaced with identical parts. Order parts from the manufacturer's parts center using the part numbers shown in this service manual, or provide the chassis number and the part reference number.

For optimum performance and reliability, all other parts should be replaced with components of identical specifications.

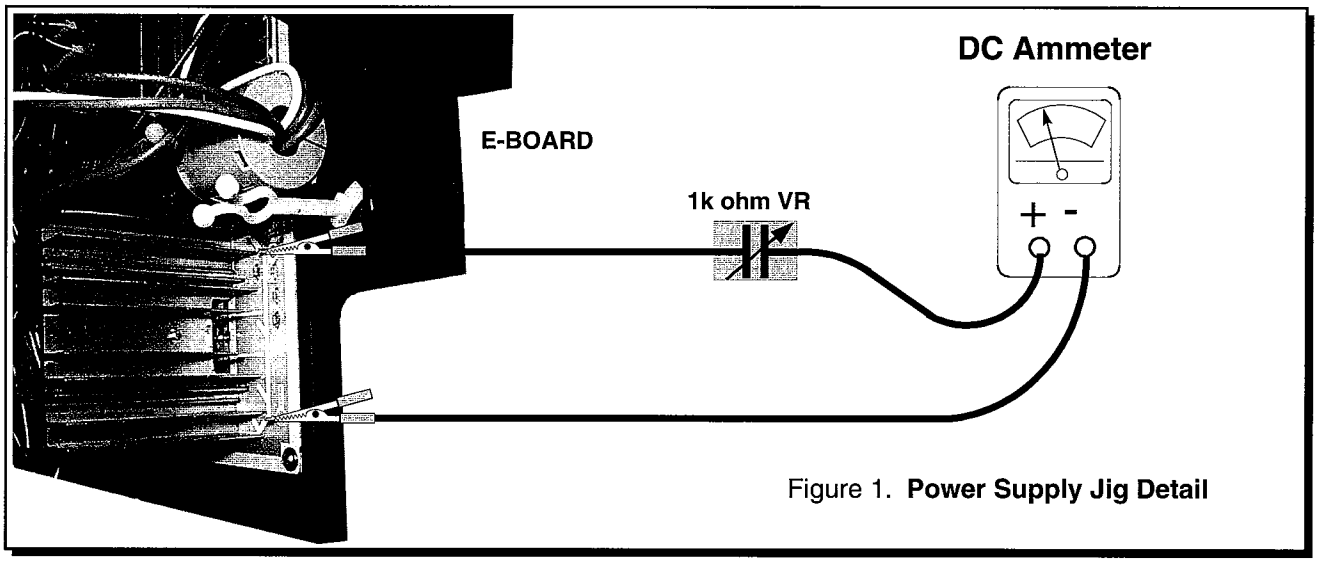


Figure 1. **Power Supply Jig Detail**

Horizontal Oscillator Disable Circuit

This chassis employs a special circuit to protect against excessive high voltage and beam current. If, for any reason, the high voltage and beam current exceed a predetermined level this protective circuit activates and detunes the horizontal oscillator that limits the high voltage.

The overvoltage protection circuit is not adjustable. However, if components indicated by the symbol ⚠ on the schematic in either the horizontal sweep system or the over-voltage protection circuit itself are changed, the operation of the circuit should be checked using the following procedure.

Equipment needed to check the disabled circuit:

1. High Voltage Meter (0 - 50kV)
2. Variac or Isolation Transformer
3. 1k ohm VR
4. DC Ammeter
5. Frequency Counter

Preparation

1. Connect Receiver to AC 120 Volts. Do not turn ON.
2. Connect Frequency counter to pins 5 & 6 of FBT.
3. Connect HIGH VOLTAGE meter to 2nd anode (HV button). ***Note:*** *use cold ground* (⏚) or DAG GND connector for negative lead.
4. Prepare DC Ammeter/1k ohm VR jig to be connected between TPP81 and TPP82 as shown above.

Procedure

1. Turn power ON. Apply a monoscope pattern.
2. Set Picture and Brightness controls to a minimum
3. Turn power OFF.
4. Connect DC Ammeter/1k ohm VR jig between **TPP81** and **TPP82** as shown above.
5. Turn on power. Turn on PIP, same channel. Observe and note current and frequency.
6. Using the variable resistor slowly increase the current (as shown on ammeter) until the horizontal sync frequency abruptly increases (as shown on frequency counter) indicating that the horizontal frequency is just beginning to pull out of sync. Confirm that PIP picture disappears before the Main Picture horizontal sync is disabled.
7. Observe the High Voltage meter. HIGH VOLTAGE should read **less than: 39.4kV for 32".**
8. Turn power OFF. Remove DC Ammeter/1k ohm VR jig, frequency counter and HV meter.
9. Turn power ON. Reset Picture and Brightness controls. Confirm B+ **140V ±1.6V** with 120V AC applied.

IF HIGH VOLTAGE IS NOT WITHIN THE SPECIFIED LIMIT, THE CAUSE MUST BE DETERMINED BEFORE THE RECEIVER IS RETURNED TO THE OWNER.

Receiver Feature Table

FEATURE\MODEL	CT-32XF56A	CT-32XF56CA
Chassis	DX1D (Double Scan)	DX1D (Double Scan)
Tunning system	New 144K	New 144K
# of channels	181	181
Menu language	ENG/SPAN/FR	ENG/SPAN/FR
Closed Caption	X	X
V-Chip	X	X
Picture in Picture (PIP)	2T	2T
Antenna input	2RF	2RF
Remote Model #	EUR511155	EUR511155
Picture tube	M80LNL161X	M80LNL161X
SuperFlat/Black	X	X
Comb filter	3D Y/C	3D Y/C
H Edge Correction	W/VEC	W/VEC
YNR	New	New
VM	X	X
V/A norm (X=both)	X	X
Color Temp	X	X
Natural AI	X	X
MTS/SAP/DBX	X	X
Built-in audio power	10W/Ch (10%)	10W/Ch (10%)
# of speakers	2 + Sub Woofer	2 + Sub Woofer
Speaker Type	Twin Drive	Twin Drive
Sub Woofer	X	X
Bass/Balance/Treble Control	X	X
AI Sound (SMPL)	X	X
A/V in (rear/front)	X	X
A/V Program Out	X	X
Audio Output	FAO, VAO	FAO, VAO
S-VHS in (rear/front)	2/0	2/0
Dolby Center Channel In	X	X
Dimensions mm **(HxWxD) in**	654.8x 814.6 x 539.8 25.8 x 32.1 x 21.3	654.8x 814.6 x 539.8 25.8 x 32.1 x 21.3
Weight (kg/lb)	56.2 / 124.0	56.2 / 124.0
Power soruce (V / Hz)	120 / 60	120 / 60
Power consumption, Max (A)	2.2	2.2
Anode voltage	31.0kV ±1.0kV	31.0kV ±1.0kV
Video input jack	$1V_{p-p}$ 75W phono jack	$1V_{p-p}$ 75W phono jack
Audio input jack	500mV RMS 47kW	500mV RMS 47kW

Table 1. **Receiver Features**

FEATURE\MODEL	CT-32XF56A	CT-32XF56CA
S-Video input jack	S-Video (Y-C) Connecto	S-Video (Y-C) Connecto
DTV input jack ($Y/P_B/P_R$)	75W phono jack	75W phono jack
A-Board TNP2AH0218	AB	AB
C-Board TNPA1130	NIL	NIL
D-Board TNPH0219	NIL	NIL
E-Board TNPA1131	NIL	NIL
F-Board TNPA1058	AB	AB
N-Board TNP2AA027	AB	AB
V-Board TNPA1133	NIL	NIL
W-Board TNPA1134	NIL	NIL
X-Board TNPA1135	NIL	NIL
Y-Board TNPA1059	AG	AG

Table 1. **Receiver Features**

Specifications are subject to change without notice or obligation.
Dimensions and weights are approximate.

Location of Controls (Receiver)

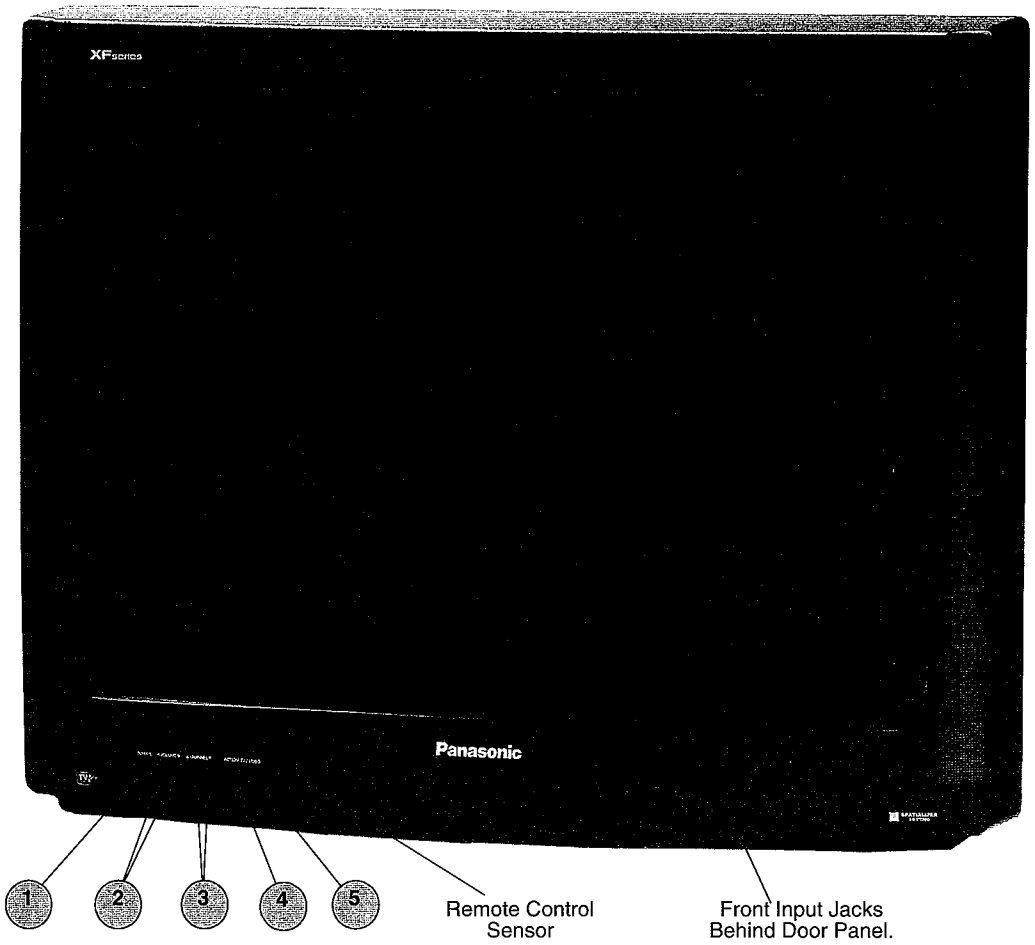


Figure 2. Location of Controls Receiver

Quick Reference Control Operation

Quick Reference Control Operation	
1	**Power Button -** Press to turn ON or OFF.
2	**Volume Buttons -** Press to adjust Sound Level, or to adjust Audio Menus, Video Menus, and select operating features when menus are displayed
3	**Channel Buttons -** Press to select programmed channels. Press to highlight desired features when menus are displayed. Also use to select Cable Converter box channels after programming Remote Control Infra-red codes (the TV/AUX/CABLE switch must be set in CABLE position).
4	**Action Button -** Press to display Main Menu and access On Screen feature and Adjustment Menus.
5	**TV/Video Button -** Press to select TV or one of two Video Inputs, for the Main Picture or the PIP frame (when PIP frame is displayed).

Location of Controls (Remote)

POWER Button

Press to turn ON and OFF.

MUTE Button

Press to mute sound.
A second press resumes sound.
Press also to access and delete Closed Caption display.

VCR, DVD(LD/CD)☆, AUX, RCVR, TV, DTV, CBL, DBS, RCVR

Component function buttons

VOL (volume) Buttons

Press to adjust TV sound level.
Use with Channel buttons to navigate in menus.

R-TUNE (Rapid Tune) Button

Press to switch to the previous channel.

ACTION Button

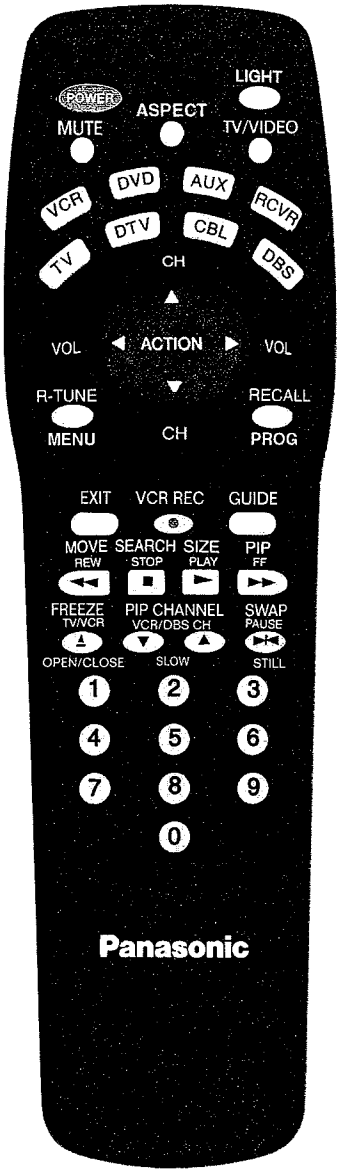
Press to display Main Menu and access or exit On Screen features and Adjustment Menus.

REW, PLAY, FF, TV/VCR, STOP, PAUSE, REC, VCR CHANNEL

Component function buttons.

DBS EXIT, DBS GUIDE

DBS function buttons.



EUR511155
CT-32XF56A
CT-32XF56CA

LIGHT

Press to light remote control buttons.

ASPECT Button

Select picture size (ratio) to match programming format.

TV/VIDEO Button

Press to select TV or Video input.

CH (channel) Buttons

Press to select channels.
Use with volume buttons to navigate in menus.

RECALL Button

Press to display Time, status of Sleep Timer, Channel, Video mode and Channel Caption (Station Identifier).

OPEN/CLOSE, SLOW, STILL

DVD function buttons.

"0" - "9"

Press numeric keypad to select any channel.

Figure 3. Location of Controls (Remote)

Disassembly for Service

Back Cover

Remove all the screws marked with an arrow(◄) from the back of the Receiver.

Note: *Screw configuration, type, and number of screws vary depending on the model of the Receiver serviced and the application; various models are covered in this Manual. Use same hardware when reassembling the receiver.*

- 3 screws at the top edge of the Receiver.
- 2 screw at each lower corner of the Receiver.
- 1 screw by the retainer plate of the AC power cord.
- 1 screw by the Antenna/Splitter input.
- 3 screw by the A/V jacks.

Main Chassis: A-Board Assembly (F, N, W, X, and Y-Boards included) & D-Board

The N, W, and X-Boards are assembled on the Main chassis (A-Board). When servicing these boards, extension cables may be required. Cables kit can be ordered from Matsushita Services Company, Part No. TXAZS011SER. The A-Board assembly rests in a chassis tray along with the D-Board (Power Supply).

Slide chassis tray out. Gently lift tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

a. The A-Board is secured to the chassis tray with 6 screws.
b. The D-Board is secured to the chassis tray with 6 screws. (V-Board is mounted on D-Board)
c. The A-Board is mated to the D-Board with two flexible connectors, A53 & A54 (D3 & D4 on the D-Board, respectively). To remove either boards, unplug the connectors on the A-Board.

Note: *Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal.*

C-Board - CRT Output

Plugs into socket on CRT neck with 3 locking snaps (squeeze each snap to release).

E-Board -Main Power

4 screws secure the board assembly to the right side of the cabinet.

F-Board -3D Comb Filter

Plugs onto the A-Board between the X and Y-Boards at the A11 and A12 connectors.
Note: Use a small flat head screwdriver to release the connector locking tabs.

N-Board - VIF/SIF & MTS Decoder

Soldered on the A-Board to the right of the Y-Board at the A21 and A22 connectors.

V-Board - 220V Protecion, Focus Short Protection, Moire Compensation

Plugs onto the D-Board at the D35, D36, and D37 connectors.

W-Board - VIF/SIF & MTS Decoder

Plugs onto the A-Board at the A72 connector.

X-Board - AV1/AV2 Jacks, S-Video Connector, A/V Switch, S-Video Switch, Comb Filter and To Audio AMP Jacks

Plugs onto the left side of the A-Board at the A1 connector.

Y-Board - PIP Processing

Plugs onto the A-Board between the F and N-Boards at the A15 and A16 connectors.

R & L Speakers

4 screws secure each speaker to the front cabinet.

SubWoofer Speaker Assembly

2 screws secure the speaker assembly to the left side of the cabinet.

Keyboard Push Button Assembly

Fastened to the inside of the cabinet front with up to 3 screws.

Disassembly for CRT Replacement

1. Discharge the CRT as instructed in the **Safety Precautions** (see page 3) and remove 2nd anode button from the CRT.
2. Remove E-Board assembly and Sub Woofer Module.
3. Disconnect connectors: CRT-Board = C2, C4 and C6 (black dag ground). D-Board = D16 (DY), Degauss coil (Deg).
4. Perform complete removal of Main chassis, Power Supply (D-Board) and CRT-Board as instructed in **Disassembly For Service**.

CRT Replacement

1. Perform **Disassembly for CRT Replacement** procedure.
2. Insure that the CRT H.V. anode button is discharged before handling CRT. See **Safety Precautions** (page 3) on handling the picture tube.
3. Remove the remaining components from the CRT neck and place cabinet face down on a soft pad.
4. Remove the CRT mounting screws from each corner. Remove the CRT with the degaussing coil and the dag ground braid attached.
5. Remove the degaussing coil from the clampers at each corner of the CRT. (Note original location and mounting of degaussing coil assembly to insure proper re-installation on the replacement CRT.)
6. Remove the dag ground braid by unhooking the coil spring from the bottom CRT mounting ears and releasing braid ends from the upper mounting ears.
7. Mount the dag ground braid on the replacement CRT.
8. Snap on new degaussing coil clampers to each corner mounting ear of replacement CRT and replace degaussing coil. Make sure coil fastens to all clamps. Dress coil as originally installed.
   Note: *Degaussing coil must be dressed 2" away from the deflection yoke.*
9. Mount the replacement CRT into cabinet.
10. Replace components and re-install chassis into the cabinet. Make sure all plugs get connected. (disconnected in **Disassembly for CRT Replacement**, Step 3.)

Chassis Service Adjustment Procedures

All service adjustments are factory preset and should not require adjustment unless controls and/or associated components are replaced.

Note: *Connect the (-) lead of the voltmeter to the appropriate ground. Use IC801's heat sink when the HOT ground symbol (⏚) is used. Otherwise, use COLD ground (⏚) — Tuner shield, IC451's heat sink or FA2.*

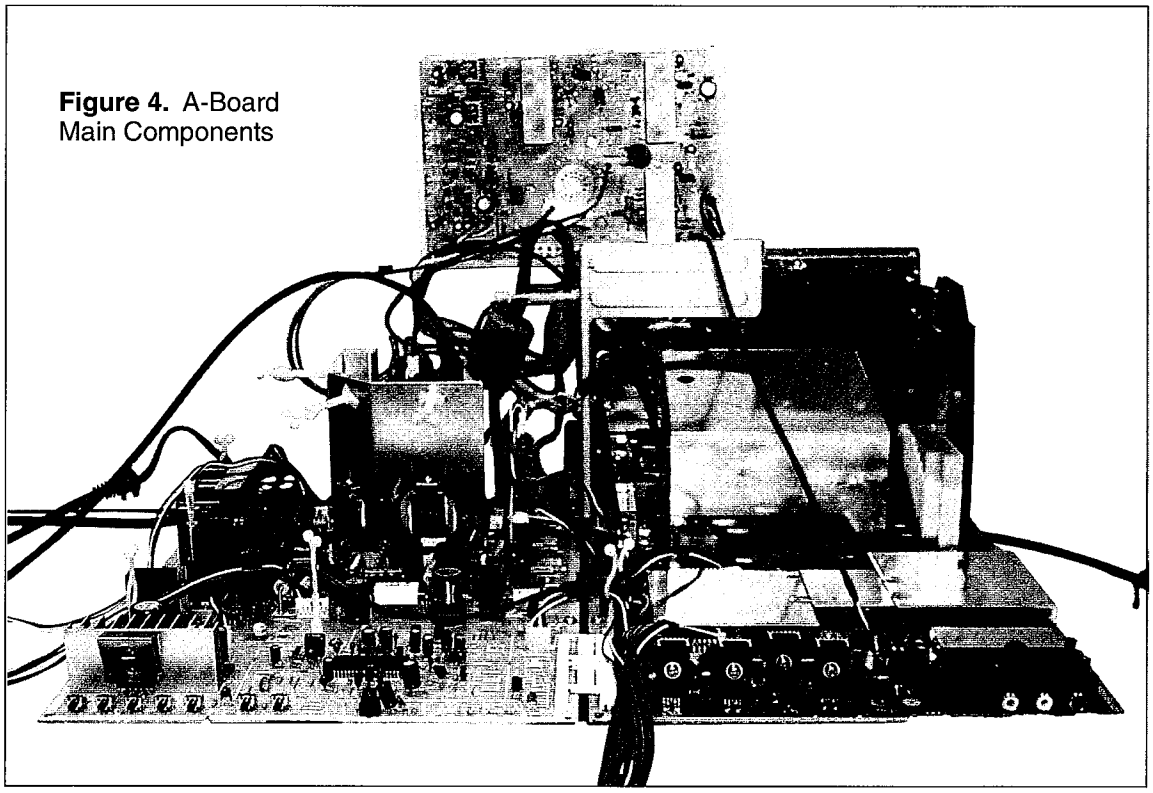


Figure 4. A-Board Main Components

MOMENTARILY CONNECT A JUMPER FOR ENTERING SERVICE MODE (FA1 to FA2)

141.0V B+ Voltage Confirmation

1. Using the Picture Menu, adjust **BRIGHT, PICTURE,** and **COLOR** to minimum. Set **AUTOCOLOR** to **OFF**.
2. Connect the DVM between C809(+ side) located on the E-Board and hot ground (⏚).
3. Confirm that B+ voltage is **140V ±1.6V.** This voltage supplies B+ to the Horizontal Output & Flyback circuits.

Source Voltage Chart

Connect 120V AC line input. Set **BRIGHT** and **PICTURE** to Minimum, using the Picture Menu. Set **AUTOCOLOR** to **OFF**. Use hot ground (⏚) or cold ground (⏚) for the (-) lead of the DVM as needed.

Adjust Picture Menu for normalized video adjustments.

Location	32"
TPE140 (B2) **(E-Board)**	+140V ±3V
TPE24 (B3) **(E-Board)**	+24V ±1.5V
TPE29 (B4) **(E-Board)**	+33V ±2V
TPE14 (B5) **(E-Board)**	+13.8V ±1V
TPE7 (B6) **(E-Board)**	+6.6V ±0.8V
C825 (+) side **(E-Board)**	+12V ±0.3V
C558 (+) side **(D-Board)**	+220V ±15V
C562 (+) side **(D-Board)**	+27V ±2V
C515 (+) side **(D-Board)**	+6.5V ±0.6V
C3829 (+) side **(D-Board)**	+12.6V ±2V
C3824 (+) side **(D-Board)**	+8.6V ±1.5V
C822 (+) side **(A-Board)**	+9.0V ±0.25V
C886 (+) side **(A-Board)**	+9.0V ±0.25V
C890 (+) side **(A-Board)**	+5.0V ±0.15V
C894 (+) side **(A-Board)**	+5.0V ±0.15V
C897 (+) side **(A-Board)**	+3.3V ±0.15V
C6581 (+) side **(A-Board)**	+3.3V ±0.15V
C047 (+) side **(A-Board)**	+5.0V ±0.15V

High Voltage Check

1. Select an active TV channel and confirm that horizontal is in sync.
2. Confirm B+ **141±1.6V** is within limit.
3. Adjust BRIGHT and PICTURE Video Controls of PICTURE Icon menu to Minimum.
4. Set AUTOCOLOR of PICTURE Icon menu to OFF.
5. Using a calibrated high voltage meter confirm that High Voltage is: **31.0kV±1.0kV (32").**

Purity and Convergence Procedure

Adjustment is necessary only if the CRT or the deflection yoke is replaced or if the setting was disturbed. The complete procedure consists of:

1. Vertical Raster Shift Adjustment. **(Only for Models with Purity/Convergence Assembly with 4 Pairs of Rings)**.
2. Initial static convergence.
3. Setting the purity.
4. Final static convergence.

When the CRT or the Yoke is Replaced

Place the yoke on the CRT neck (do not tighten the clamp).

For a 2-piece assembly (see Fig. 5):

Position purity/convergence assembly as shown and tighten clamp snugly. Remove the hot-melt glue seal on assembly and position like tabs of purity device together at 12 o'clock to reduce its magnetic field effect.

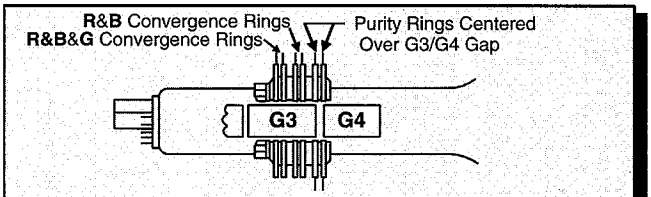


Figure 5. Positioning of Purity/Convergence Assembly (2-piece assembly)

For models using 4 pairs of rings, place the vertical raster shift tabs at 3 o'clock (90° from the purity and convergence tabs, see Fig. 6 and Fig. 7)

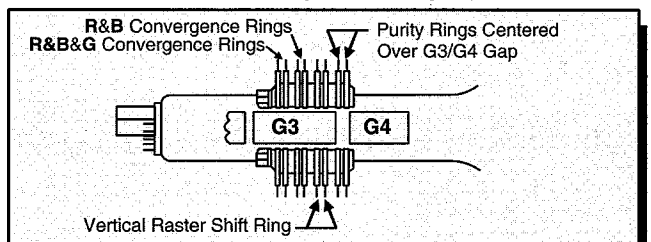


Figure 6. Positioning of Purity/Convergence Assemby (4 Pairs of Rings)

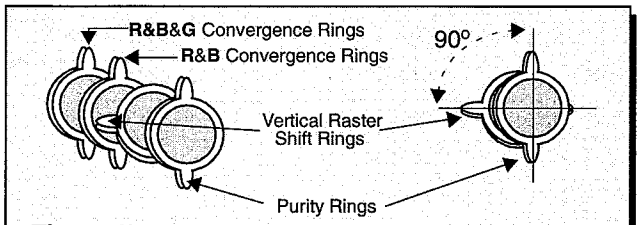


Figure 7. Positioning of Purity/Convergence Assemby (4 Pairs of Rings)

For a 1-piece assembly (see Fig. 8):

Position like tabs of purity devices together at 12 o'clock to reduce any magnetic field effect. (For better results, note part number and look for specifications at Service Center)

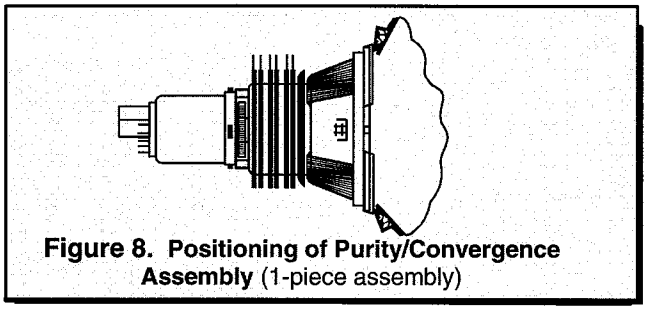


Figure 8. Positioning of Purity/Convergence Assembly (1-piece assembly)

For either assamblies:

Turn the Receiver ON. Operate the Receiver for 60 minutes using the first Purity Check field (white screen) to stabilize the CRT.

Fully degauss the Receiver by using an external degaussing coil.

Slide the deflection yoke back and forth on the neck of the CRT until it produces a near white, uniform raster.

IVertical Raster Shift Adjustment **(Only for Models with Purity/Convergence Assembly with 4 Pairs of Rings)**.

Apply a green pattern with a horizontal line, adjust the Deflection Yoke so that has no tilt, then secure it.

Adjust center line of the pattern with the mechanical center of the CRT, this center is determined by two marks at the side edges of the screen. To adjust the line, once the vertical raster shift tabs are place at 3 o'clock to reduce its magnetic field effect (see Fig. 6 and Fig. 7) open the tabs the same angle from the center, until the center line of the pattern becomes a straight line, centered with the marks of the CRT. (see Fig. 9)

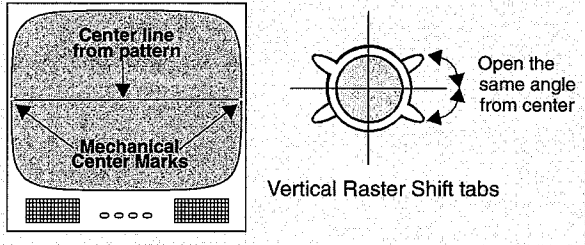


Figure 9. Vertical Raster Shift Adjustment (4 pairs of rings assembly)

Initial Center Static Convergence

Connect a dot/cross hatch generator to the Receiver and tune in a signal. Observe misconvergence at center of the screen only.
Adjust the R&B pole magnets; by separating tabs and rotating to converge blue with red.
Adjust the R&B and R&B&G pole magnets: by separateing tabs and rotating to converge blue and red (magenta) with green.

Note: *Precise convergence at this point is not important.*

Purity Adjustment

When the Receiver is in the Servicemen Mode for making electronic adjustments, press the **Recall** button on the Remote Control to enter Purity Check. (See **Service Adjustments Electronic Controls.**)
Operate the Receiver for 60 minutes using the first Purity Check field (white screen) to stabilize the CRT.
Fully degauss the Receiver by using an external degaussing coil.
Press the **Recall** button on the Remote Control again until the Purity Check (green screen) appears.
For a 2-piece assembly (see Fig. 5)**:**
Loosen the deflection yoke clamp screw and move the deflection yoke back as close to the purity magnet as possible.
Adjust the front rings to set the vertical green raster precisely at the center of the screen (see Fig. 10).

NOTES:
1. CRT warm up with white screen (three guns activated) is needed to stabilize the shadow mask expansion.
2. Initial center static convergence (roughly centers three gun beams) is required in order to perform purity adjustment.

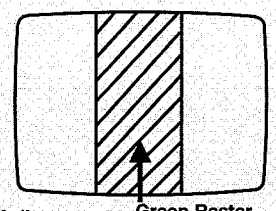


Figure 10. Green Raster Adjustment

Slowly move the deflection yoke forward until the best overall green screen is displayed.

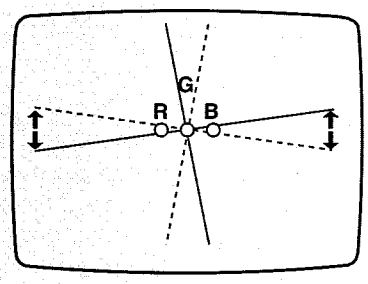
For a 1-piece assembly (see Fig. 8)**:**
Slowly move the deflection yoke and purity rings assembly toward the CRT board and adjust the purity magnet rings to set vertical green raster at center of screen (see Fig. 10).
Gradually move the deflection yoke & purity rings forward and adjust for best overall green screen.
Continue from here for either assemblies:
Tighten the deflection yoke clamp screw.
Press the **Recall** button on the Remote Control again until the purity check (blue screen) and (red screen) appear and observe that good purity is obtained on each respective field.
Press the **Recall** button on the Remote Control again until Purity check (white screen) appears. Observe the screen for uniform white. If purity has not been achieved, repeat the above procedure.

Final Convergence Procedure (see Fig. 11 through Fig. 13):

Note: *Vertical size and focus adjustments must be completed prior to performing the convergence adjustment. Connect a dot pattern generator to the Receiver. The* ***Brightness*** *level should not be higher than necessary to obtain a clear pattern.*
Converge the red and the blue dots at the center of the screen by rotating the R&B pole Static Convergence Magnets.
Align The converged red/blue dots with the green dots at the center of the screen by rotating the R&B&G pole Static Convergence Magnets. Melt wax with soldering iron to reseal the magnets.
Slightly tilt vertically and horizontally (do not rotate) the deflection yoke to obtain a good overall convergence.
If convergence is not reached at the edges, insert permalloy (see following section) from the DY corners to achieve proper convergence. Recheck for purity and readjust if necessary.
After vertical adjustment of the yoke, insert wedge at 11 o'clock position, then make the horizontal tilt adjustment.
Secure the deflection yoke by inserting two side wedges at 3 and 7 o'clock positions.
Apply adhesive between tab (thin portion) of wedge and CRT and place tape over the tab to secure to the CRT.

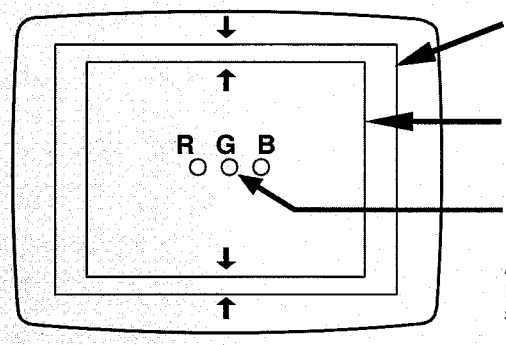
Permalloy Convergence Corrector Strip (Part No. 0FMK014ZZ)

This strip is used in some sets to match the yoke and CRT for optimum convergence. If the yoke or CRT is replaced, the strip may not be required.
First converge the set without the strip and observe the corners.
If correction is needed:
1. Place strip between CRT and yoke, in quadrant needing correction. Slowly move it around for desired results.
2. Press adhesive tightly to the CRT and secure with tape.



As the yoke is tilted vertically, the rasters produced by the outside guns rotate in opposite directions.

Figure 11. Vertical Yoke Movement



Raster produced from one of the outside electron beams

Raster from the other side electron beam

Static convergence magnets are set for center convergence

As the yoke is tilted horizontally, one raster gets larger while the other gets smaller

Figure 12. Horizontal Yoke Movement

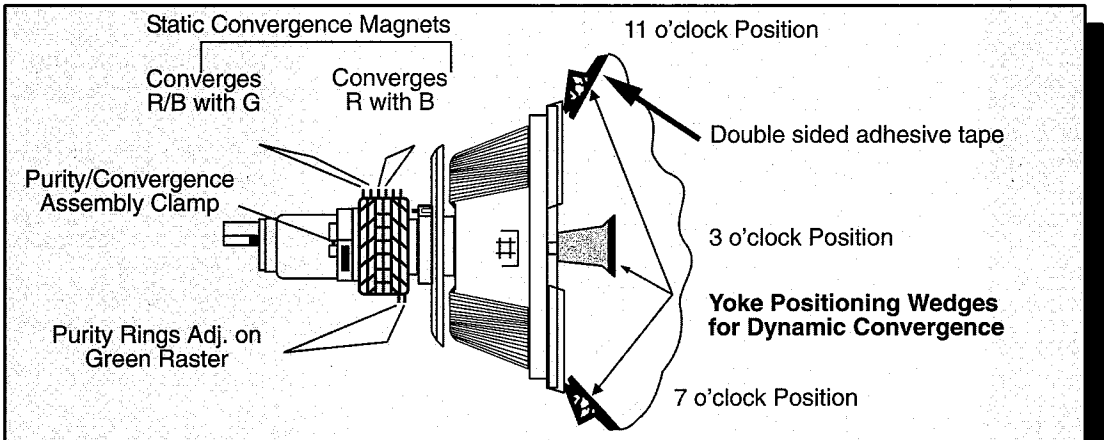


Figure 13. Convergence Magnets and Wedges Location

Note: *For models using 4 pairs of rings assemblies see Fig. 6 for details*

Serviceman Mode (Electronic Controls)

This Receiver has electronic technology using the I²C Bus Concept. It performs as a control function and it replaces many mechanical controls. Instead of adjusting mechanical controls individually, many of the control functions are now performed by using "On Screen Display Menu". (The **Serviceman Adjustment Mode**.)

Note: *It is suggested that the technician reads all the way through and understand the following procedure for Entering/Exiting the **Serviceman Adjustment Mode**; then proceed with the instructions working with the Receiver. When becoming familiar with the procedure, the Flow Chart for Serviceman Mode may be used as a quick guide.*

Quick Entry to Serviceman Mode:

At times when minor adjustments need to be done to the electronic controls, the method of Entering the serviceman Mode without removal of the cabinet back is as follows using the Remote Control:

1. Select SET-UP icon and select CABLE mode.
2. Select TIMER icon and set SLEEP time for 30 Min.
3. Press ACTION button twice to exit menus.
4. Tune to the Channel 124.
5. Adjust VOLUME to minimum (0).
6. Press the VOL ◀ button (decrease) **on Receiver**. Red "CHK" appears in upper corner.

To toggle between Aging and Serviceman modes:

While the "CHK" is displayed on the left top corner of the CRT, pressing the Action and the Volume Up buttons on the Receiver simultaneously will toggle between the modes. Red "CHK" for Serviceman and yellow "CHK" for Aging.

7. **Press** the **Power** Button on the **Remote Control** to select one of six Serviceman Adjustment Modes.
   1) **B** = Serviceman VCJ SUB-DATA ADJUSTEMENT.
   2) **C** = Serviceman VCJ CUT-OFF ADJUSTMENT.
   3) **D** = Serviceman PINCUSHION ADJUSTMENT.
   4) **P** = Serviceman PIP ADJUSTMENTS.
   5) **S** = Serviceman OPTIONS ADJUSTMENTS.
   6) **W**= Serviceman W-OPTIONS ADJUSTMENTS.
   7) **Y** = Serviceman Y-OPTIONS ADJUSTMENT.
   8) "**CHK**" = Normal operation of CHANNEL ▲▼ and VOLUME ◀ ▶.

Note: *Only the applicable settings for the Receiver serviced will be available (See **a** in Fig. 14).*

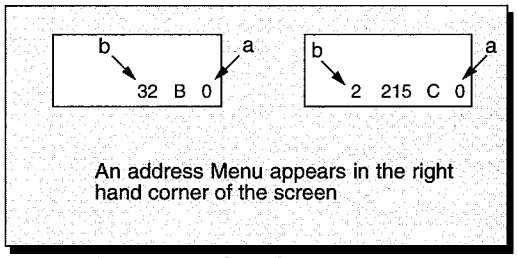


Figure 14. Serviceman Mode Menu

Exiting the Serviceman Mode:

Press the **Action** and the **Power** buttons on the **Receiver** simultaneously for at least 2 seconds.

THE RECEIVER EXITS SERVICEMAN MODE.

The Receiver momentarily shuts off; then comes back on tuned to channel 3 with a preset level of sound. Any programmed channels, channels caption data and some others user defined settings will be erased.

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Press the **Power Button** on the **Remote Control** to select the Serviceman Adjustment.

For Sub- Data Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 14).

   Note: *Write Down the original value set (**b** in* Fig. 14*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 14).

Sub-Data Adjustment		Adj. Range	Defaul tLevel
B00	SUB-COLOR (NTSC)	0 ~ 63	28
B01	SUB-TINT (NTSC)	0 ~ 63	51
B02	SUB-BRIGHTNESS (NTSC)	0 ~ 192	80
B03	SUB-CONTRAST (NTSC)	0 ~ 63	43
B04	SUB-SHARPNESS (NTSC)	0 ~ 128	50
B05	SUB-COLOR (525I)	0 ~ 63	48
B06	SUB-TINT (525I)	0 ~ 63	45
B07	SUB-BRIGHTNESS (525I)	0 ~ 192	95
B08	SUB-CONTRAST (525I)	0 ~ 63	29
B09	SUB-SHARPNESS (525I)	0 ~ 128	70
B0A	RF AGC	0 ~ 255	132
B0B	SUB-BRIGHT for AI (AI on)	0 ~ 192	84
B0C	SUB-COLOR for AI (AI on)	0 ~ 15	5
B0D	SUB-TINT (VIDEO)	0 ~ 15	0
B0E	SUB-COLOR (525P)	0 ~ 63	33
B0F	SUB-TINT (525P)	0 ~ 63	45
B10	SUB-BRIGHTNESS (525P)	0 ~ 192	110
B11	SUB-CONTRAST (525P)	0 ~ 63	33
B12	SUB-SHARPNESS (525P)	0 ~ 128	90

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Press the **Power Button** on the **Remote Control** to select the Serviceman Adjustment.

For Cut-Off Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 14).

   Note: *Write Down the original value set (**b** in* Fig. 14*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 14).

Cut-Off Adjustment		Adj. Range	Defaul tLevel
C00	R-CUTOFF (NTSC)	**	2 25
C01	G-CUT-OFF (NTSC)	0 ~ 255	140
C02	B-CUT-OFF (NTSC)	**	2 105
C03	BRIGHTNESS (NTSC)	0 ~ 63	32
C04	SUB-BRIGHTNESS (NTSC)	0 ~ 192	80
C05	R-DRIVE	0 ~ 127	95
C06	B-DRIVE	0 ~ 127	90
C07	R-DRIVE CORR (COOL)	0 ~ 63	32
C08	B-DRIVE CORR (COOL)	0 ~ 63	32
C09	R-DRIVE CORR (WARM)	0 ~ 63	32
C0A	B-DRIVE CORR (WARM)	0 ~ 63	32
C0B	R-CUTOFF (525I)	**	2 96
C0C	G-CUTOFF (525I)	0 ~ 255	140
C0D	B-CUTOFF (525I)	**	2 123
C0E	R-CUTOFF (525P)	**	2 74
C0F	G-CUTOFF (525P)	0 ~ 255	140
C10	B-CUTOFF (525P)	**	2 120

*** **NOTE:** Range is in steps:*
0 00 ~ 0 255
1 00 ~ 1 255
2 00 ~ 2 255
3 00 ~ 3 255

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Press the **Power Button** on the **Remote Control** to select the Serviceman Adjustment.

For Pincushion Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 14).

   Note: *Write Down the original value set (**b** in* Fig. 14*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 14).

Pincushion Adjustment		Adj. Range	Defaul tLevel
D00	VERT AMP (NORM)	0 ~ 127	100
D01	VERT POS (NORM)	0 ~ 255	100
D02	VERT LINEARITY (NORM)	0 ~ 63	32
D03	VERT S CORR (NORM)	0 ~ 63	32
D04	TRAPEZOID (NORM)	0 ~ 63	17
D05	EW DC (NORM)	0 ~ 63	32
D06	EW AMP (NORM)	0 ~ 63	24
D07	EW CORNER BTM (NORM)	0 ~ 15	7
D08	EW CORNER TOP (NORM)	0 ~ 15	0
D09	HORIZ POS (NORM)	0 ~ 31	17
D0A	SIDEPIN (NORM)	0 ~ 15	5
D0B	PARALLEL (NORM)	0 ~ 15	9
D0C	VERT EHT GAIN (NORM)	0 ~ 7	3
D0D	HORIZ EHT GAIN (NORM)	0 ~ 7	2
D0E	EHT AC GAIN (NORM)	0 ~ 7	5
D0F	DAC MODE (NORM)	0 ~ 1	0
D10	MOIRE (NORM)	0 ~ 255	0
D11	AFC1 GAIN (NORM)	0 ~ 3	0
D12	H DAF POS (NORM)	0 ~ 255	186
D13	H DAF GAIN (NORM)	0 ~ 255	97
D14	V DAF GAIN (NORM)	0 ~ 255	66
D15	V DAF POS (NORM)	0 ~ 255	157
D16	VERT AMP (WIDE)	0 ~ 127	49
D17	VERT POS (WIDE)	0 ~ 255	113
D18	VERT LINEARITY (WIDE)	0 ~ 63	19
D19	VERT S CORR (WIDE)	0 ~ 63	14
D1A	TRAPEZOID (WIDE)	0 ~ 63	25
D1B	EW DC (WIDE)	0 ~ 63	32
D1C	EW AMP (WIDE)	0 ~ 63	32
D1D	EW CORNER BTM (WIDE)	0 ~ 15	8
D1E	EW CORNER TOP (WIDE)	0 ~ 15	7
D1F	HORIZ POS (WIDE)	0 ~ 31	18
D20	SIDEPIN (WIDE)	0 ~ 15	6
D21	PARALLEL (WIDE)	0 ~ 15	8
D22	VERT EHT GAIN (WIDE)	0 ~ 7	1
D23	HORIZ EHT GAIN (WIDE)	0 ~ 7	2
D24	EHT AC GAIN (WIDE)	0 ~ 7	7
D25	DAC MODE (WIDE)	0 ~ 1	0
D26	MOIRE (WIDE)	0 ~ 255	0
D27	AFC1 GAIN (WIDE)	0 ~ 3	1
D28	H DAF POS (WIDE)	0 ~ 255	125
D29	H DAF GAIN (WIDE)	0 ~ 255	97
D2A	V DAF GAIN (WIDE)	0 ~ 255	97
D2B	V DAF POS (WIDE)	0 ~ 255	127

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Press the **Power Button** on the **Remote Control** to select the Serviceman Adjustment.

For PIP Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 14).
   Note: *Write Down the original value set (**b** in* Fig. 14*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*
2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 14).

PIP Adjustment		Adj. Range	Defaul tLevel
P00	PIP COLOR	0 ~ 127	63
P01	PIP TINT	0 ~ 255	54
P02	PIP BRIGHTNESS	0 ~ 31	15
P03	PIP CONTRAST	0 ~ 127	66
P04	PIP V POS 9 TOP	0 ~ 255	120
P05	PIP V POS 9 BOTTOM	0 ~ 255	122
P06	PIP H POS 9 LEFT	0 ~ 255	32
P07	PIP H POS 9 RIGHT	0 ~ 255	7
P08	PIP V POS 16 TOP	0 ~ 255	7
P09	PIP V POS 16 BOTTOM	0 ~ 255	8
P0A	PIP H POS 16 LEFT	0 ~ 255	8
P0B	PIP H POS 16 RIGHT	0 ~ 255	32
P0C	PIP FREERUN	0 ~ 0	0
P0D	PIP Y DELAY	0 ~ 15	7

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Press the **Power Button** on the **Remote Control** to select the Serviceman Adjustment.

For Options Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 14).
   Note: *Write Down the original value set (**b** in* Fig. 14*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*
2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 14).

Options Adjustment		Adj. Range	Defaul tLevel
S00	MTS INPUT LEVEL	0 ~ 63	45
S01	MTS PLL VCO	0 ~ 63	36
S02	MTS FILTER	0 ~ 63	35
S03	MTS LOW SEPARATION	0 ~ 63	43
S04	MTS HI SEPARATION	0 ~ 63	24
S05	LOUD COMPENSATION	0 ~ 15	7
S06	SPATIALIZER	0 ~ 63	32
S07	BASS MIX	0 ~ 3	1
S08	CLOCK ADJUST	0 ~ 255	128
S09	CC DIGITAL FILTER SW	0 ~ 1	1
S0A	CC SCROLL	0 ~ 2	2
S0B	CIP CONTRAST (NTSC)	0 ~ 127	57
S0C	CIP BRIGHTNESS (NTSC)	0 ~ 127	32
S0D	CIP UBVR CLAMP (NTSC)	0 ~ 127	64
S0E	CIP BLK LEVEL (NTSC)	0 ~ 127	43
S0F	CIP U GAIN (NTSC)	0 ~ 127	64
S10	CIP V GAIN (NTSC)	0 ~ 127	66
S11	CIP CONTRAST (DTV)	0 ~ 127	64
S12	CIP BRIGHTNESS (DTV)	0 ~ 127	32
S13	CIP UBVR CLAMP (DTV)	0 ~ 127	63
S14	CIP BLK LEVEL (DTV)	0 ~ 127	63
S15	CIP U GAIN (DTV)	0 ~ 127	63
S16	CIP V GAIN (DTV)	0 ~ 127	63
S17	VM AMP GAIN (NTSC)	0 ~ 255	148
S18	VM LIMIT GAIN (NTSC)	0 ~ 255	127
S19	DSC LARGE GAIN (NTSC)	0 ~ 255	127
S1A	DSC SMALL GAIN (NTSC)	0 ~ 255	127
S1B	NOT APPLICABLE	0 ~ 255	127

Options Adjustment		Adj. Range	Defaul tLevel
S1C	NOT APPLICABLE	0 ~ 255	127
S1D	NOT APPLICABLE	0 ~ 255	127
S1E	VM AMP GAIN (DTV)	0 ~ 255	127
S1F	VM LIMIT GAIN (DTV)	0 ~ 255	127
S20	DSC LARGE GAIN (DTV)	0 ~ 255	127
S21	DSC SMALL GAIN (DTV)	0 ~ 255	128
S22	NOT APPLICABLE	0 ~ 255	127
S23	NOT APPLICABLE	0 ~ 255	127
S24	NOT APPLICABLE	0 ~ 255	127
S25	VCJ COLOR	0 ~ 127	63
S26	VCJ TINT	0 ~ 127	63
S27	VCJ BRIGHTNESS	0 ~ 255	128
S28	VCJ CONTRAST	0 ~ 127	65
S29	VCJ R DRIVE	0 ~ 255	128
S2A	VCJ B DRIVE	0 ~ 255	127
S2B	VCJ R-Y AXIS ANGLE	0 ~ 31	15
S2C	VCJ B-Y AXIS GAIN	0 ~ 63	48
S2D	VCJ HORIZ CENTER	0 ~ 31	15
S2E	NOT APPLICABLE	0 ~ 28	14
S2F	NOT APPLICABLE	0 ~ 28	14
S30	ACL GAIN	0 ~ 15	7
S31	ACL START (NTSC)	0 ~ 4	2
S32	BLACK GRADIENT GAIN	0 ~ 15	7
S33	BLACK GRADIENT START	0 ~ 15	8
S34	WHT GRAD GAIN (NTSC)	0 ~ 15	7
S35	WHT GRAD START (NTSC)	0 ~ 15	7
S36	WHT CHAR GAIN	0 ~ 15	7
S37	WHT CHAR START	0 ~ 15	7
S38	B-Y AXIS GAIN (NTSC)	0 ~ 63	35
S39	B-Y AXIS GAIN (525I)	0 ~ 63	32
S3A	R-Y AXIS ANGLE	0 ~ 7	6

Options Adjustment		Adj. Range	Defaul tLevel
S3B	G-Y MATRIX SW	0 ~ 3	1
S3C	ACL SW	0 ~ 1	0
S3D	WHITE GRADIENT SW	0 ~ 1	0
S3E	BLACK GRADIENT SW	0 ~ 1	0
S3F	B-Y AXIS GAIN (525P)	0 ~ 63	32
S40	BLANKING SW	0 ~ 1	0
S41	FORCED 525P SW	0 ~ 1	0
S42	COMP FOR WEAK FIELD	0 ~ 255	127
S43	COMP FOR VM	0 ~ 255	127
S44	COMP FOR SHARPNESS	0 ~ 255	127
S45	YG CLAMP LEVEL	0 ~ 127	40
S46	Y OFFSET LEVEL	0 ~ 255	127
S47	ACL START (525P)	0 ~ 15	7
S48	WHT GRAD GAIN (525P)	0 ~ 15	7
S49	WHT GRAD START (525P)	0 ~ 15	8
S4A	ACL START (WIDE)	0 ~ 15	7
S4B	WHT GRAD GAIN (WIDE)	0 ~ 15	7
S4C	WHT GRAD START (WIDE)	0 ~ 15	8
S4D	BLANKING POS CORR	0 ~ 22	0
S4E	SEMI-TRA OFFSET (NORM)	0 ~ 63	32
S4F	SEMI-TRA OFFSET (WIDE)	0 ~ 63	32
S50	H-SYNC NOSYNC - 525I	1 ~ 270	251
S51	H-SYNC 525I - NONSTD	305 ~ 414	324
S52	H-SYNC 525P- NONSTD	415 ~ 524	505
S53	H-SYNC 525P - 1125I	590 ~ 631	610
S54	DC-RESTORATION CORR	0 ~ 1	1

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Press the **Power Button** on the **Remote Control** to select the Serviceman Adjustment.

For W-Options Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 14).
   Note: *Write Down the original value set (**b** in* Fig. 14*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*
2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 14).

W Options Adjustment		Adj. Range	Defaul tLevel
W00	SVP TMP FACTOR	0 ~ 3	3
W01	SVP HEC LEVEL	0 ~ 7	3
W02	SVP VEC LEVEL	0 ~ 7	3
W03	SVP HEC CORING GAIN	0 ~ 7	4
W04	SVP VEC CORING GAIN	0 ~ 7	4
W05	SVP MOTION DET LEVEL	0 ~ 7	4
W06	SVP Y LEVEL	0 ~ 31	16
W07	SVP H/VEC SHADE GAIN	0 ~ 15	7
W08	SVP H/VEC SHADE CORING	0 ~ 7	4

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Press the **Power Button** on the **Remote Control** to select the Serviceman Adjustment.

For Y-Options Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 14).
   Note: *Write Down the original value set (**b** in* Fig. 14*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*
2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 14).

Y Options Adjustment		Adj. Range	Defaul tLevel
Y00	SYNC SEPARATION	0 ~ 7	4
Y01	SYNC SEPARATION	0 ~ 255	122
Y02	SYNC SEPARATION	0 ~ 255	122
Y03	SYNC SEPARATION	0 ~ 255	122
Y04	V PHASE COMP HLD (START)	0 ~ 7	3
Y05	V PHASE COMP HOLD (END)	0 ~ 15	7
Y06	H CLAMP MODE LEVEL	0 ~ 255	122
Y07	V EDGE CORING LEVEL	0 ~ 31	16
Y08	V EDGE CORR LIMIT LVL	0 ~ 15	7
Y09	3D NON-STD JUDGE LVL	0 ~ 15	8
Y0A	3D STD JUDGE LVL	0 ~ 15	8
Y0B	1F2F MOV DET HIGH LVL	0 ~ 15	7
Y0C	1F2F MOV DET LOW LVL	0 ~ 15	7
Y0D	MOVEMENT DET SET	0 ~ 15	7
Y0E	MOVEMENT DET TEST	0 ~ 1	0
Y0F	V EDGE GAIN	0 ~ 3	1
Y10	1F COLOR MOV LVL SET	0 ~ 15	8
Y11	1F COLOR MOV LVL SET	0 ~ 15	7
Y12	MOVE DETECTION SET	0 ~ 15	7
Y13	COL MOV EDGE DET LVL	0 ~ 15	8
Y14	IF MOVEMENT DET LVL	0 ~ 15	7
Y15	2F MOVEMENT DET LVL	0 ~ 15	7
Y16	1F MOT DET FILTER SW	0 ~ 1	0
Y17	1F MOT DET EDGE SENS	0 ~ 1	1
Y18	1F MOT DET SENSITIVITY	0 ~ 15	8
Y19	1F MOV DET HIGH LVL	0 ~ 15	7
Y1A	1F MOV DET LOW LVL	0 ~ 15	7
Y1B	2F MOV DET HIGH LVL	0 ~ 15	8
Y1C	2F MOV DET LOW LVL	0 ~ 15	7
Y1D	MOT DET EDGE DET LVL	0 ~ 15	7
Y1E	AI V SAMPL START POS	0 ~ 31	15
Y1F	AI V SAMPL STOP POS	0 ~ 63	32
Y20	AI H SAMPL START POS	0 ~ 31	16
Y21	AI H SAMPL STOP POS	0 ~ 63	32
Y22	BURST GATE PULSE POS	0 ~ 255	122
Y23	BLK EXP APL THRESH LVL	0 ~ 63	32
Y24	PEDESTAL COMPENSATION	0 ~ 7	3
Y25	BLK EXP APL CALC INIT VAL	0 ~ 31	15
Y26	BLK COMP VAR LIMITER	0 ~ 15	7

Y Options Adjustment		Adj. Range	Defaul tLevel
Y27	LUMINANCE DIFF GAIN	0 ~3	1
Y28	PSEUDO CONT KILLER SW	0 ~ 1	0
Y29	BLK EXP APL REFLECTION	0 ~ 1	0
Y2A	BASE VALUE	0 ~ 15	7
Y2B	BLK EXP VAR REFLECTION	0 ~ 3	2
Y2C	ANTI BLOOM APL THRESH	0 ~ 63	32
Y2D	S1 HISTOGRAM LIMITER	0 ~ 63	32
Y2E	S2 HISTOGRAM LIMITER	0 ~ 63	32
Y2F	S3 HISTOGRAM LIMITER	0 ~ 63	32
Y30	S4 HISTOGRAM LIMITER	0 ~ 63	32
Y31	Ymin DET OFFSET	0 ~ 7	3
Y32	Ymin DET GAIN	0 ~ 3	2
Y33	Ymin LIMITER	0 ~ 63	32
Y34	Ymax LIMIT VALUE	0 ~ 63	32
Y35	AI FLESH TONE EFFECT SW	0 ~ 1	1
Y36	APL CORR LIMITER	0 ~ 63	32
Y37	APL CORR SW POINT	0 ~ 127	62
Y38	COLOR CONT LVL (L APL)	0 ~ 63	32
Y39	COLOR CONT GAIN (L APL)	0 ~ 3	1
Y3A	COLOR CONT GAIN (H APL)	0 ~ 63	32
Y3B	AI COLOR CORR GAIN	0 ~ 3	1
Y3C	COLOR DET GAIN	0 ~ 3	1
Y3D	COLOR DET THRESHOLD	0 ~ 63	32
Y3E	DSC NOISE REMOVAL	0 ~ 63	32
Y3F	DSC DELAY SW	0 ~ 1	0
Y40	DSC OFF SW	0 ~ 1	1
Y41	DSC LIMIT LEVEL	0 ~ 255	112
Y42	CLIP POINT OF EDGE CORR	0 ~ 15	8
Y43	BPF SW (RF)	0 ~ 3	2
Y44	BPF SW (VIDEO)	0 ~ 3	1
Y45	DSC GAIN SW (BIG SIGNAL)	0 ~ 3	1
Y46	DSC LIMIT SW (BIG SIGNAL)	0 ~ 63	32
Y47	DSC GAIN SW (SML SIGNAL)	0 ~ 3	1
Y48	DSC LIMIT SW (SML SIGNAL)	0 ~ 63	32
Y49	EDGE CORR GAIN SW	0 ~ 15	8

Y Options Adjustment		Adj. Range	Defaul tLevel
Y4A	DETAIL CORR LIMIT LEVEL	0 ~ 15	8
Y4B	B CORR GAIN ON EDGE	0 ~ 3	1
Y4C	CORING LEVEL ON EDGE	0 ~ 63	32
Y4D	VM FREQ SW	0 ~ 1	1
Y4E	VM CORING LEVEL	0 ~ 15	8
Y4F	VM LIMIT LEVEL	0 ~ 127	62
Y50	VM B CORR SW	0 ~ 1	0
Y51	Y DELAY ADJ	0 ~ 7	3
Y52	C DELAY ADJ (RF)	0 ~ 15	8
Y53	C DELAY ADJ (VIDEO)	0 ~ 15	8
Y54	DCOR CORR COEFFI A	0 ~ 255	122
Y55	DCOR CORR COEFFI B	0 ~ 255	122
Y56	DCOR CORR COEFFI C	0 ~ 255	122
Y57	VMLM CORR COEFFI A	0 ~ 255	122
Y58	VMLM CORR COEFFI B	0 ~ 255	122
Y59	SHARP OFFSET LEVEL	0 ~ 127	62
Y5A	WECOR THRESHOLD (STRONG SIG)	0 ~ 255	122
Y5B	WECOR THRESHOLD (WEAK SIG)	0 ~ 255	122
Y5C	BRST IN JDG TIME (16msXn)	0 ~ 255	122
Y5D	BRST OUT JDG TIME (16msXn)	0 ~ 255	122
Y5E	SD THRESHOLD (ON)	0 ~ 255	122
Y5F	SD THRESHOLD (OFF)	0 ~ 255	122
Y60	VP THRESHOLD (max)	0 ~ 255	122
Y61	VP THRESHOLD (min)	0 ~ 255	122
Y62	VP JDG TIME(NG-OK) 16msXn	0 ~ 255	122
Y63	VP JDG TIME(OK-NG) 16msXn	0 ~ 255	122
Y64	STD JDG TIME 16msXn	0 ~ 255	122
Y65	SD JDG TIME(NG-OK) 16msXn	0 ~ 255	122
Y66	SD JDG TIM(OK-NG) 16msXn	0 ~ 255	122
Y67	FRE AVG QUANTITY	0 ~ 4	2

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

To Check Purity:

Press the **Recall** Button on the **Remote Control** when in Serviceman Mode (red "CHK" is displayed) to enter the Purity Field Check Mode.

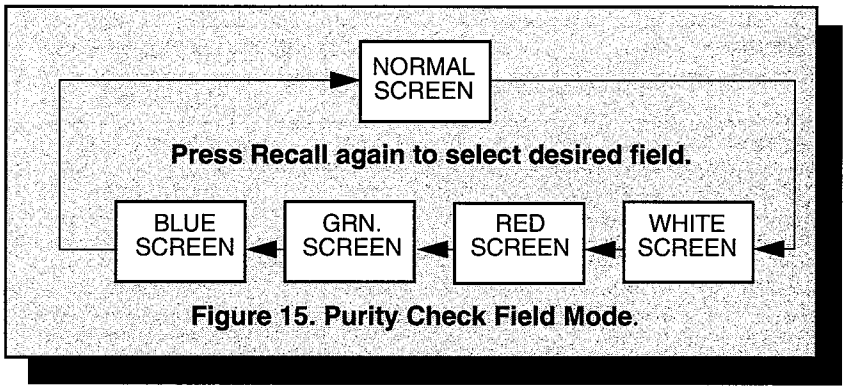


Figure 15. Purity Check Field Mode.

Helpful Hints

Entering Serviceman Mode (Back-Open Method)

1. While the Receiver is ON and operating in Normal Mode, momentarily short test point **FA1** (TP8) to Cold Ground (⏚) **FA2** (TP3) A-Board.
   The Receiver enters the Aging Mode.
   Yellow letters "CHK" appear in the upper left corner of the CRT.
   (The Volume Up/Down will adjust rapidly).
2. Simultaneously press the **Action** and the **Volume Up** buttons on the **Receiver** Control Panel.
   The Receiver enters the Serviceman Mode.
   The letter in "CHK" turn red.
   (The Volume Up/Down will adjust normally).
   (All costumer controls are set to nominal level).

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Instructional Flow Chart for Serviceman Mode

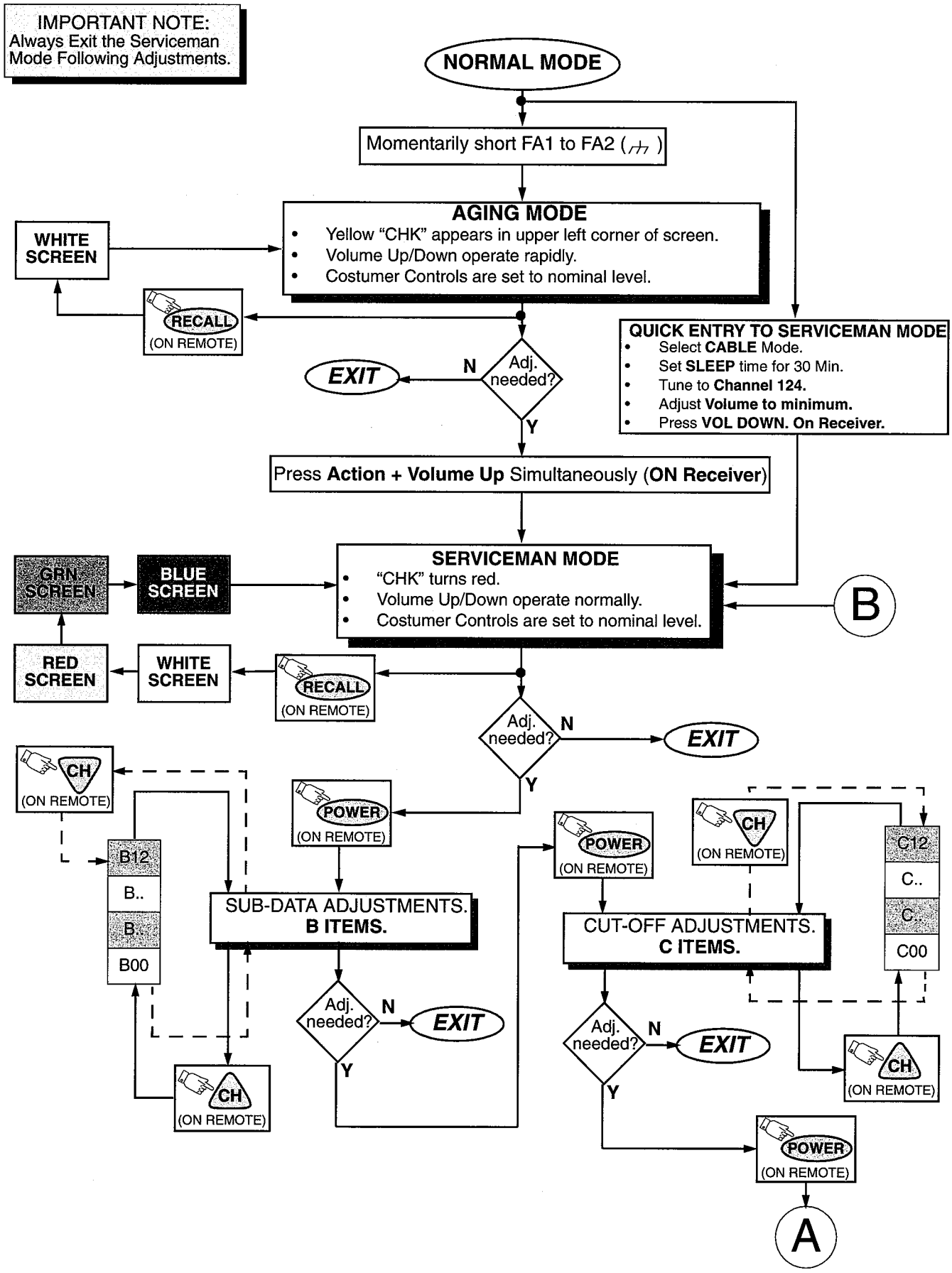


Figure 16. Flow Chart for Serviceman Mode.

Instructional Flow Chart for Serviceman Mode - Continued

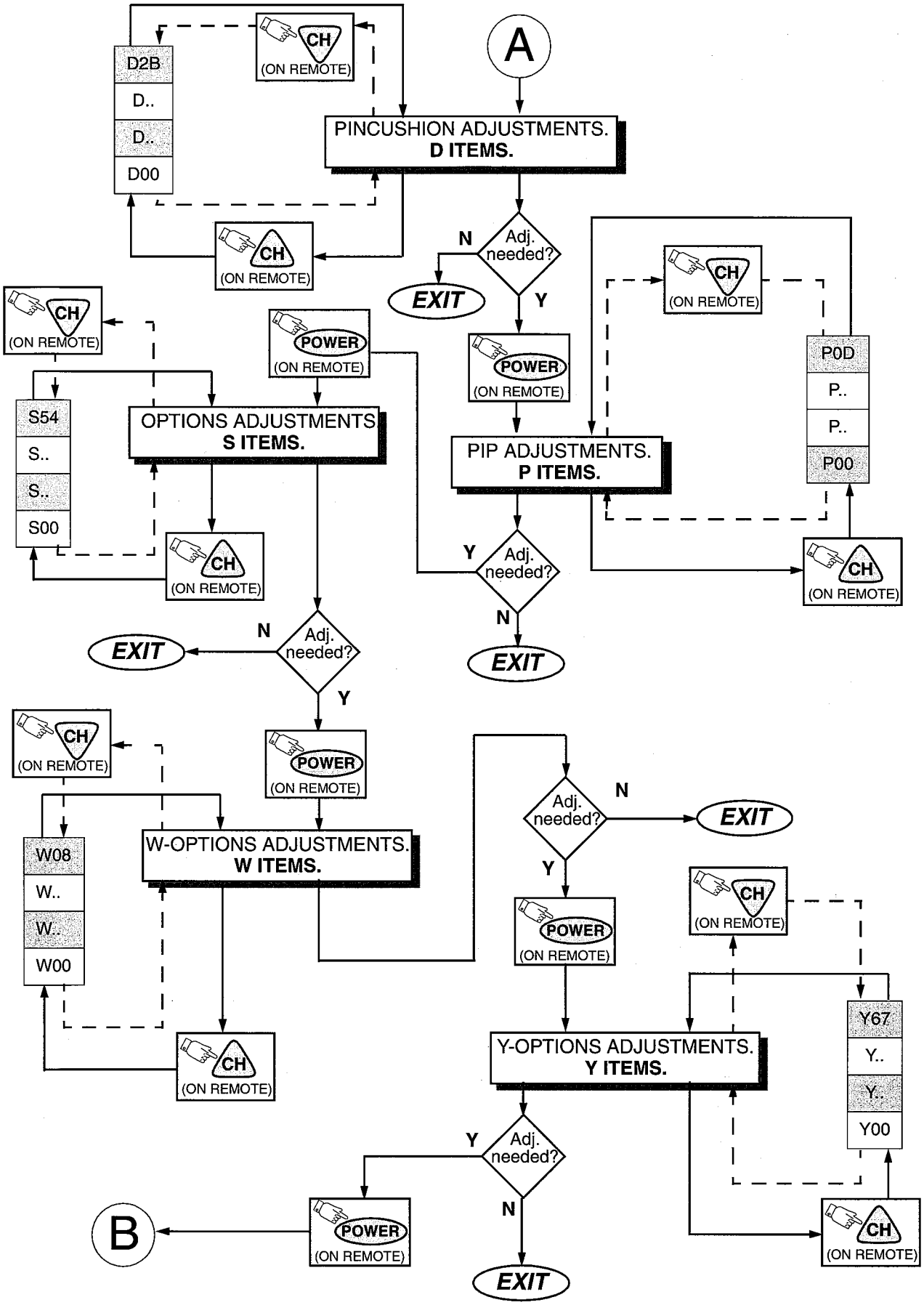


Figure 17. Flow Chart for Serviceman Mode (Continued).

Service Adjustments (Electronic Controls)

RF AGC

Serviceman DAC Adjustment BA

This adjustment should be performed only if overloading on strong signal or busy background (snow) is present on moderate strength signals.

Preparation

1. Connect a DVM to **TP15.**

Procedure:

1. Receive a 63 ±2dB (75 ohm open) signal.
2. Note reference voltage. Confirm that noise appears when register **BA** is decreased.
3. Slowly increase **BA.** Confirm that noise disappears. Continue increasing **BA** until the reference voltage is obtained.
4. Confirm RF AGC voltage (reference voltage) lowers when the signal field strength is increased by 3dB.

Sub-Brightness

Serviceman DAC Adjustment (B2)

This adjustment is important for getting proper operation of customer brightness and picture controls. The adjustment must be made after Sub Contrast or Color Temperature adjustments are made. **Do not adjust** the SCREEN VR after Sub-Brightness is set.

Preparation

Connect a color bar signal with 100 IRE white and 7.5 IRE black. (Switch COLOR to OFF on the generator.) Operate television for a minimum of 10 minutes prior to the adjustment.

Procedure

In Serviceman Mode for making electronic adjustments, select DAC adjustment (B2) and adjust until the black bar starts to look grey. Then decrease the adjustment to the point where grey turns to black.

Sub-Contrast

Serviceman DAC Adjustment (B3-NTSC; B8-DTV)

This adjustment is factory set. **Do not adjust** unless repairs are made to associated circuit, the CRT Board or the CRT is replaced.

Preparation

1. Connect a generator pattern with 87.5% modulation, 70% saturated color bar with a 100 IRE white and 7.5 black.

Note: *The pattern used in this procedure is an EIA color bar pattern with 87.5% modulation with 100 IRE white and 7.5 black. Correlate the information in this procedure to your pattern used.*

2. Set the Picture Icon Menu Video (Picture Icon Menu) controls as follow:
   PICTURE ....Max.
   BRIGHTNESS, COLOR..... .....Min.
   SHARPNESS ....Center
   AI Picture..... .....Off
3. Switch VIDEO NR to OFF (if available).
4. In the Serviceman Mode:
   Note the original settings for S3E, S3D & S3C, then set S3E, S3D & S3C to 1.
5. Connect the oscilloscope to TP47G (CRT-Board connector C1-4 or TP35). Set the scope time base to 20ms (horizontal).
6. Connect a jumper from TP-6 to ground (⏚).

Procedure

1. Select DAC Adjustment (B2-NTSC; B7-DTV) and adjust to **1~1.5Vp-p** between blanking and 7.5 IRE to prevent black level from compressing (see Fig. 18).
2. Select DAC Adjustment (B3-NTSC; B8-DTV) and adjust until **2.8Vp-p ±0.1V** from white level to black level is measured on video waveform (See video waveforms detail, Fig. 18).

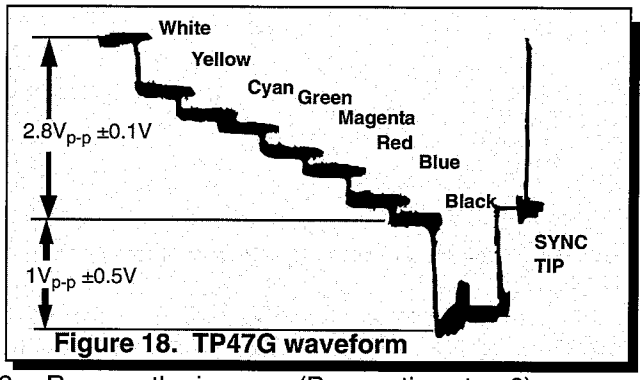


Figure 18. TP47G waveform

3. Remove the jumpers (Preparation step 6).
4. Reset S3C, S3D & S3E to 0.

Sub-Tint/Color Adjustment

Serviceman DAC Adjustment (B1) (B0)

Preparation

1. Normalize the Video adjustments (Picture Icon Menu).
2. Switch AUTOCOLOR (Picute Icon Menu) to OFF.
3. Connect a jumper between connector test pin TP-6 and ground (⏚).
4. In the Serviceman Mode for making electronic adjustments set the following:
   Note original settings then set as follows:
   C0 (RED Cutoff) 2 020
   C1 (GRN Cutoff)..... 128
   C2 (BLU Cutoff)..... .....2 020
   S3C, S3D, and S3E 01

Procedure

1. Connect a Rainbow Color Bar signal.
2. In the Serviceman Mode for making electronic adjustments, note DAC levels for RED DRIVE (C5) and BLU DRIVE (C6). Set each to 64.
3. Connect oscilloscope to the RED Output TP47R (A-Board) (or to connector C1 pin 1 or TP36 (CRT-Board).
4. In the Serviceman Mode for making electronic adjustments, select DAC Sub Bright (B2) and adjust so that no saturation appears in the displayed waveform.
5. Select DAC SUB COLOR (B0) and adjust so that peak to peak amplitude is **1.9±0.05Vp-p** .

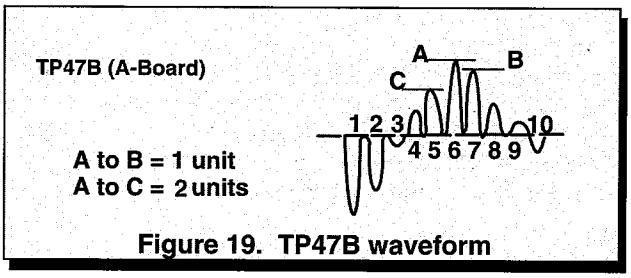


Figure 19. TP47B waveform

Service Adjustments (Electronic Controls, cont.)

6. Select DAC Sub Tint (B1) and adjust waveform so that peak B is halfway between peaks A and C as shown in Fig. 19.
7. Measure new p-p waveform voltage and confirm **1.9±0.05Vp-p**.
8. Connect oscilloscope to BLU Output (A-Board) or TP37 (CRT-Board).
9. Select DAC (S38) and adjust so peak to peak is **2.2±0.05Vp-p** (see Fig. 20).

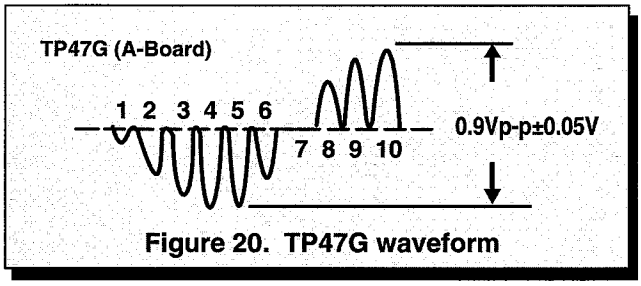


Figure 20. TP47G waveform

10. Connect oscilloscope to GRN Output (A-Board) or connector C1 pin 3 or to TP35 (CRT-Board).
11. Select DAC adjustment (B0) and adjust waveform to measure **1.1±0.02V p-p**(see Fig. 20).
12. Remove jumpers.
13. Reset DACs S3C, S3D, and S3E to 00.
14. Connect a Studio Color Bar signal and confirm that color phase and saturation are normal.

White Balance (W.B.) Adjustment (B/W Tracking)

Serviceman DAC Adjust. (C0) (C1) (C2) (C3) (C5) (C6)

Minor Touch-Up Method

OBSERVE low and high brightness areas of a B/W picture for proper tracking. Adjust only as required for "good grey scale and warm highlights".

LOW LIGHT areas - In Serviceman Mode for making electronic adjustments, select cutoff (C0) RED, (C1) GRN, (C2) BLU and adjust for picture to look grey.
HIGH LIGHT areas - In Serviceman Mode for making electronic adjustments, select Drive (C5) RED, (C6) BLU and adjust for warm whites.

Complete Adjustment

Preparation

1. Turn Receiver ON and allow 10 minutes warm up at high brightness.
2. Apply color bar signal with color set to OFF.
3. Set Picture Icon Menu Video controls to Normalize.
4. Enter Serviceman Mode and set DAC adjust low lights (C0, C2) to minimum, (C1) to 128 and set DAC adjustments high lights (C5, C6) to 64. Set Sub Bright DAC (C4) to minimum.
5. Connect 4.7KW jumper from FA1 to ground (⏚).
6. Turn SCREEN VR (part of FBT T551) fully counterclockwise.

Procedure

1. Connect the oscilloscope to TP35 (CRT-Board).
2. In Serviceman Mode for making electronic adjustment, select Sub Bright (C4).
3. Press RECALL button on the Remote Control to collapse the raster. (Service SW)
4. Observe oscilloscope waveform and adjust Serviceman Mode Sub Bright DAC (C4) until **2.3V ±0.05V** above DC ground is measured (see Fig. 21). Set B7, BB, and B10 to the same setting as C4.

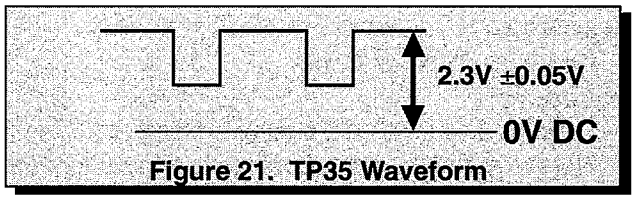


Figure 21. TP35 Waveform

5. Press RECALL button on the Remote Control to restore the raster.
6. Connect scope to GRN Cathode (KG) on CRT-Board.
7. In Serviceman Mode for making electronic adjustments, select GREEN CUTOFF DAC (C1).
8. Press RECALL button on the Remote Control to collapse the raster. (Service SW)
9. View scope trace at Horizontal rate and adjust Serviceman Mode DAC (C1) for the scanning period to be **190V± 2V** above DC ground (see Fig. 22). Set CC and CF to the same setting as C1.

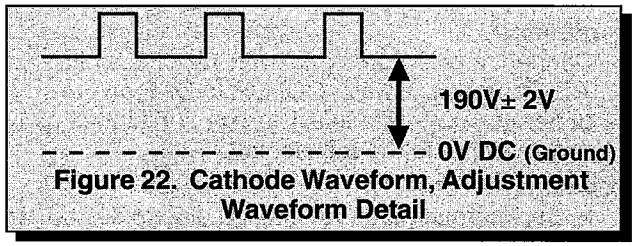


Figure 22. Cathode Waveform, Adjustment Waveform Detail

10. Turn Screen VR (part of FBT) slowly clockwise until a faint green horizontal line appears.
11. Using the other two colors Serviceman Mode DAC CUTOFF adjustments RED (C0) and BLU (C2), increase their setting to produce a white horizontal line.
12. Press RECALL button on the Remote Control to restore full raster.
13. Confirm a good gray scale by viewing B/W color bar pattern. Set CB and CE to the same setting as C0. Set CD and C10 to the same setting as C2.
14 Use Serviceman Mode for making electronic adjustments select DAC DRIVE adjustments RED (C5) and BLU (C6) and adjust for warm white in white color bar of pattern.
15 Adjust Serviceman Mode BRIGHT (C3) from low scale to high scale and check Black and White tracking.
16. If correction is needed perform **Minor Touch - Up Method.**
17. Perform Sub Brightness adjustment procedure.

Service Adjustments (Electronic Controls, cont.)

Service Pincushion Adjustments

Vertical Linearity

Serviceman DAC Adjustment (D2)

Preparation

Apply a crosshatch pattern.

Procedure

Enter Serviceman Mode for electronic adjustments. Select DAC adjustment (D2) and adjust crosshatch pattern so boxes above horizontal center are the same proportion as boxes below horizontal center.

Vertical Size & S Correction

Serviceman DAC Adjustments (D0, D3)

Preparation

Apply a crosshatch pattern.

Procedure

1. Enter Serviceman Mode for making electronic adjustments.
2. Select DAC adjustment (D0) and decrease the size of the pattern.
3. Increase the (D0) adjustment until the pattern touches the top and bottom edge of the screen. Continue to increase the level until the pattern is approximately 1/2 inch larger.
4. Select DAC adjustment (D3) and adjust until the top and bottom squares are the same proportion as the center squares.
   a. Increase the level to make top and bottom squares smaller.
   b. Decrease the level to make top and bottom squares larger.

E-W Pincushion Correction

Serviceman DAC Adjustments (D6, D7, D8)

Preparation

1. Apply a crosshatch pattern.
2. Normalize the PICTURE Icon Video adjustments.
3. Set PICTURE BRIGHTNESS and SHARPNESS at center, and set PICTURE CONTROL to max.
4. Set R786 (T/B Pincushion, on the A-Board) at center.

Procedure

1. Enter Serviceman Mode for making electronic adjustments. Select DAC (D6). Adjust for 1st and 3rd vertical lines on E & W sides to be straight (see Fig. 23).

Figure 23. . E-W pincushion adjustment

2. Select DAC (D8) and adjust vertical lines so that the top edge is straight (see Fig. 24).

Figure 24. . Top pincushion adjustment

3. Select DAC (D7) and adjust vertical lines so that the bottom edge is straight (see Fig. 25).

Figure 25. . Bottom pincushion adjustment

Horizontal Centering

Serviceman DAC Adjustment (D9)

Preparation

1. Set the Brightness and Sharpness controls at center position; set the Picture control at max.
2. Apply a crosshatch signal.

Procedure

1. In Serviceman Mode for making electronic adjustments. Select DAC adjustment (D9) and adjust until the center of the crosshatch pattern is centered (horizontally) on CRT screen.
2. EXIT the Serviceman Adjustment Mode.

Horiz Size

Serviceman DAC Adjustment (DD)

Preparation

Apply a crosshatch pattern.

Procedure

1. In Serviceman Mode for making electronic adjustments select DD and decrease the level until the pattern shrinks horizontally between the sides screen.
2. Increase DD until the pattern fills horizontally to screen sides and advance the adjustment register additional 3 digits.

Keystone

Serviceman DAC Adjustment (D4)

Preparation

Apply a crosshatch pattern.

Procedure

Enter Serviceman Mode for making adjustments. Select DAC (D4) and adjust so that vertical lines are 90^{o} from horizontal lines (see Fig. 26).

Figure 26. . Keystone adjustment

Service Adjustments (Electronic Controls, cont.)

MTS Circuit Adjustments (S1, S2, S0, S3, & S4)

The MTS Circuit Adjustments require four steps:

1. Stereo VCO Adjustment.
2. Filter Adjustment.
3. Input Level Adjustment.
4. Stereo Separation Adjustment.

Stereo VCO Adjustment (S1)

Preparation:

1. Connect a frequency counter to **TPS24**.

Note: *15 seconds aging is required prior to performing the following procedure.*

Procedure:

Adjust the MTS Stereo PLL VCO **(S1)** until the frequency counter measures **15.734kHz ±50Hz**.

Filter Adjustment (S2)

Preparation:

1. Connect a signal generator (sine wave) to antenna input.
2. Connect a scope to **TPS23**.

Procedure:

1. Apply the following signal from the signal generator: 15.734kHz, 100mV rms, sine wave.
2. Adjust the MTS Filter Adjustment **(S2)** until the amplitude displayed on the scope is minimum.

Input Level Adjustment (S0)

Preparation:

1. CConnect an RMS meter with filter jig as shown in Fig. 27.

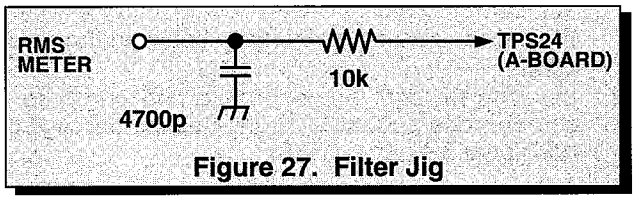


Figure 27. Filter Jig

2. Connect an RF signal generator to the RF antenna input.

Procedure:

1. Apply the following signal from the RF signal generator:
   Video: 100 IRE flat field, 30% modulation.
   Audio: 300Hz, 100% modulation, monaural (70 ±5dB, 75W OPEN, P/S 10dB).
   Make sure that 75ms pre-emphesis is OFF.
2. Adjust the MTS Input Level Adjustment **(S0)** until the voltage measured is **210 ±5mV rms**.

Stereo Separation Adjustments (S3 & S4)

Preparation:

1. Connect an RF signal generator to the RF antenna input.
2. Connect a scope to TPS24.

Procedure:

1. Apply the following signal from the RF signal generator:
   Video: 100 IRE flat field, 30% modulation.
   Audio: 300Hz, 30% modulation, stereo (left only) (70 ±5dB, 75W OPEN, P/S 10dB).
2. Adjust the MTS Low-Level Separation Adjustment **(S3)** until the amplitude displayed on the scope is minimum.
3. Apply the following signal from the RF signal generator:
   Video: 100 IRE flat field, 30% modulation.
   Audio: 3kHz, 30% modulation, stereo (left only) (70 ±5dB, 75W OPEN, P/S 10dB).
4. Adjust the MTS High-Level Separation Adjustment **(S4)** until the amplitude displayed on the scope is minimum.
5. Repeat above steps 2 through 4 until the amplitude is at minimum for both signals.

Clock Adjustment (S8)

Preparation:

Connect the frequency counter from TPS1 (IC001 Pin 34) to cold ground (⏚).

Note: *Frequency Counter probe capacitance should be 8pF or less.*

Procedure:

1. Turn the Receiver OFF with the AC power applied.
2. Measure the frequency at TPS1 (IC001 pin 34) and record the reading.

Note: *Pin 34 measurement must have at least four digits of resolution following the decimal point Example: 000.0000*

3. Turn the Receiver back ON.
4. Place the Receiver into Serviceman Mode for making electronic adjustments.
5. Select the Options Adjustments and set **S8** (Clock Adjustment DAC) to 128.
6. Calculate and set the **S8** per the formula below:

$$S8 = 128 + 1.350 \times 10^{6}\left(\frac{187.5000 - pin34[\mathrm{Hz}]}{187.5000}\right)$$

Note:*Pin 34 measurement will not change regardless of the value stored in S8.*

Service Adjustments (Mechanical Controls)

Video Level R115 (N-Board)

Caution: *Do not adjust unless control has been replaced or control was accidentally misadjusted.*

Preparation

Obtain an NTSC color bar pattern with 100 IRE white and 87.5% modulation.

Procedure

1. Connect oscilloscope to TP12 (connector A21 pin 6). Use cold ground for scope connection. Set scope at horizontal time base.
2. Adjust R115 for 1V ±0.05Vp-p from sync tip to white level (see Fig. 28).
3. Set SUB CONTRAST adjustment..

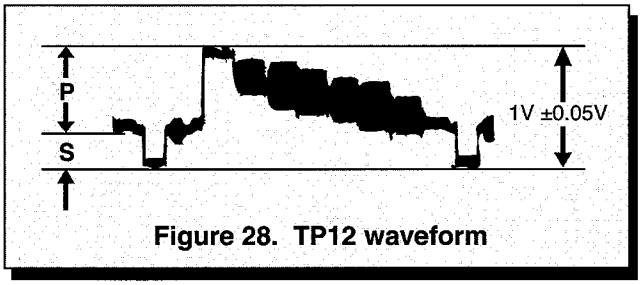


Figure 28. TP12 waveform

AFC Field Adjustment L105 (N-Board)

1. Select TV antenna mode with Set Up Menu Icon.
2. Defeat AFC by applying a jumper from TPS7 to ground (⏚).
3. Connect a digital voltmeter to AFC test point TP16.
4. Use Remote Control to check all active High Band channels 7~13 for AFC voltage range. Select channel with AFC voltage in approximate center of voltage range.
5. Adjust **L105** for **2.5V ±0.05V** at TP16.
6. Check all active channels for proper AFC correction. Touch up L105 if required. Remove jumper set in step 2.

Note: *Do not use TV/CABLE channel with offset carriers for adjustment or in determination of low and high range of AFC voltage.*

Second Tuner Adjustments (2 tuner PIP only)

VCO and DET out Adjustment

Preparation:

1. Connect a DVM to **TP16.**
2. Connect a scope to **TP12.**
2. Age set for at least 20 sec. before adjusting.

Procedure:

1. Apply a studio color bar.
2. Connect a jumper between TPS7 and GND (⏚)
3. Adjust **L2109** so that DVM reads **2.4 ±0.1V.**
4. Adjust **R2115** so that Detection output (including sync. signal) is within range of **1.0 ±0.05Vp-p.**

Focus (Part of T551)

Preparation

Connect Signal generator and select dot pattern.

Procedure

Adjust the FOCUS controls **VF1** and **VF2** to obtain the sharpest and clearest dot pattern.

** adjust for best center

** adjust for best area between center and top right corner.

Video-Chroma Signal Path Block Diagram

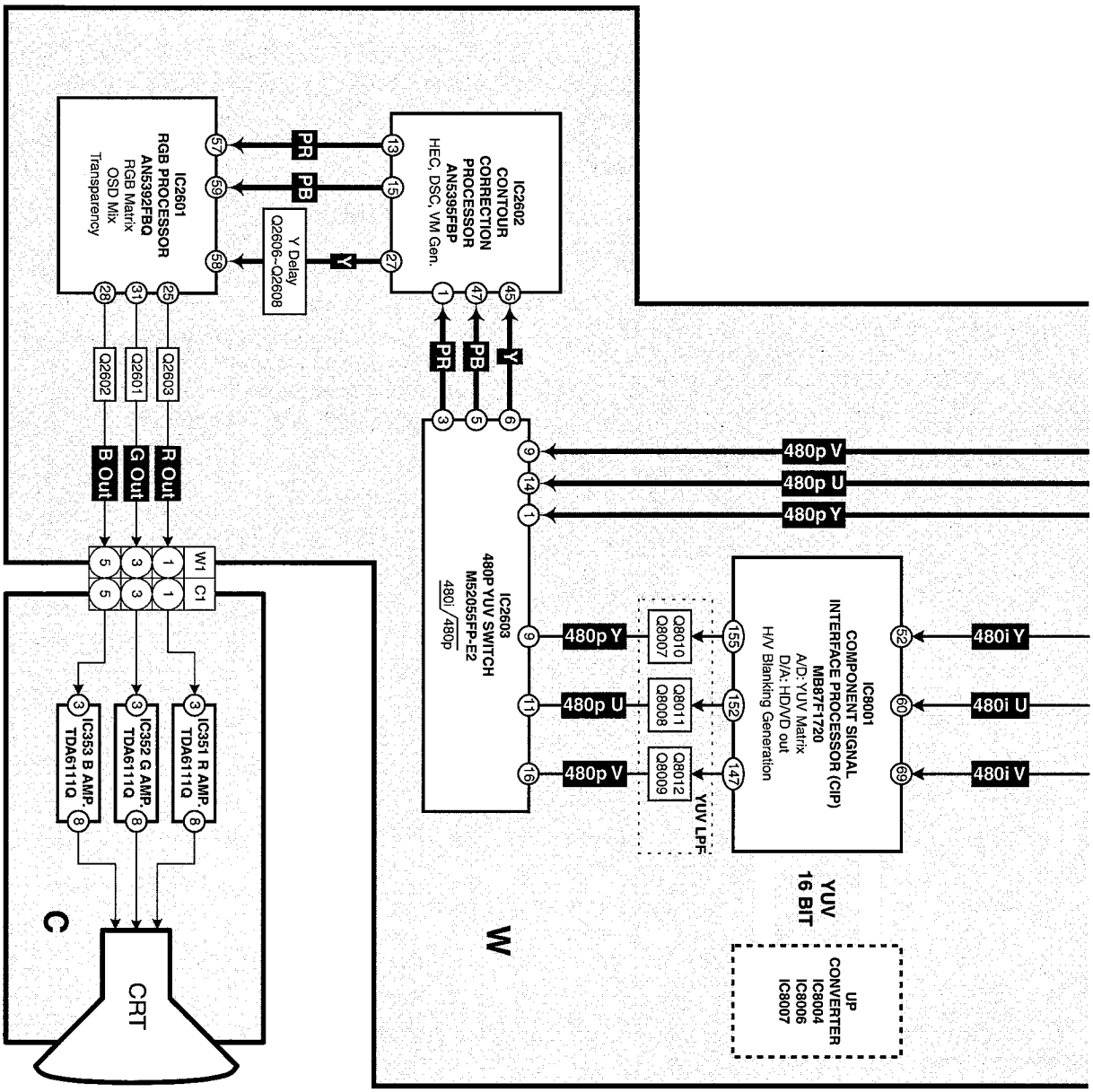


Figure 29. Video-Chroma Signal Path Block Diagram.

Video-Chroma Signal Path Block Diagram

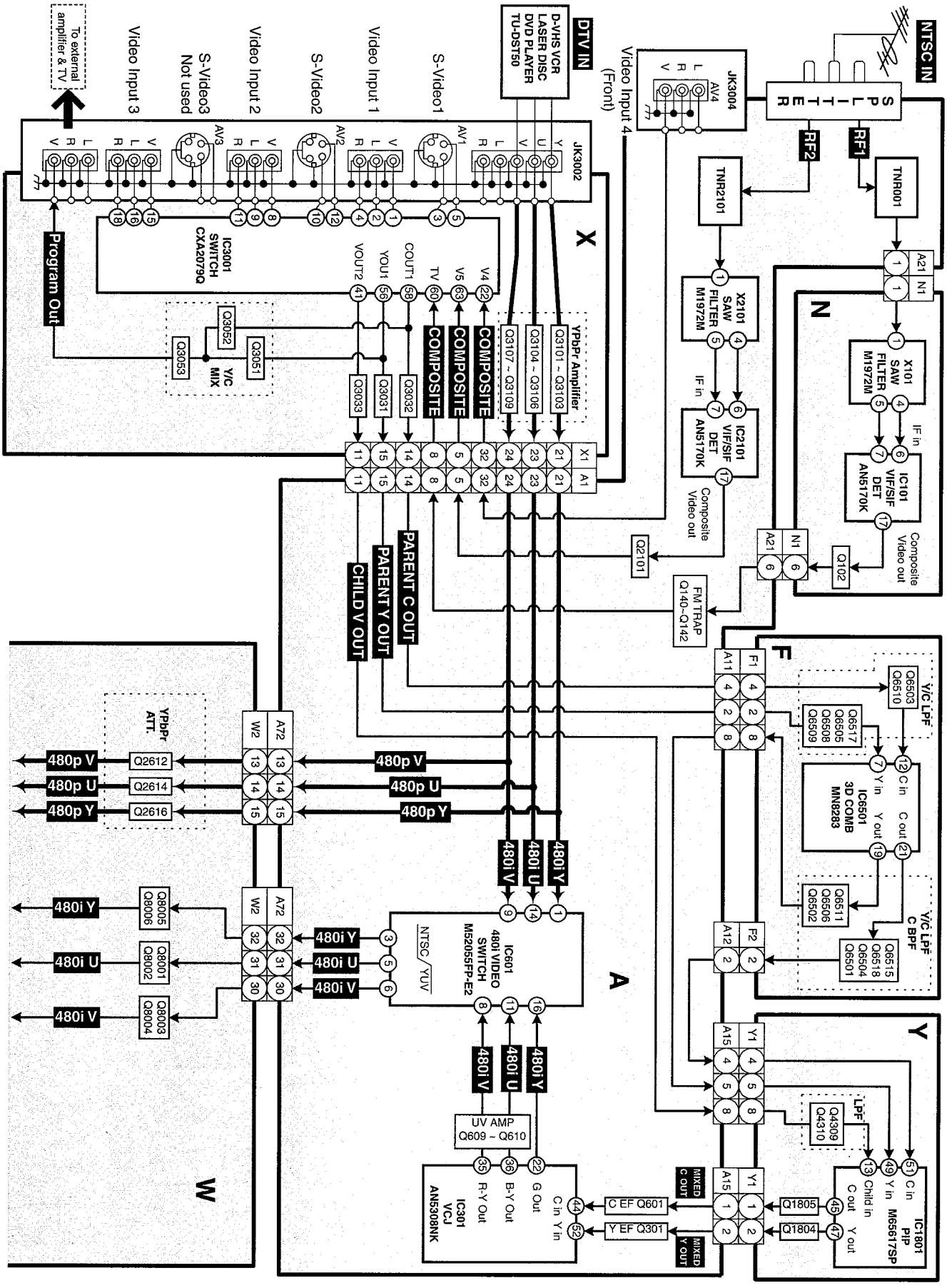


Figure 30. Video-Chroma Siganal Path Block Diagram (Cont.).

Audio Signal Path Block Diagram

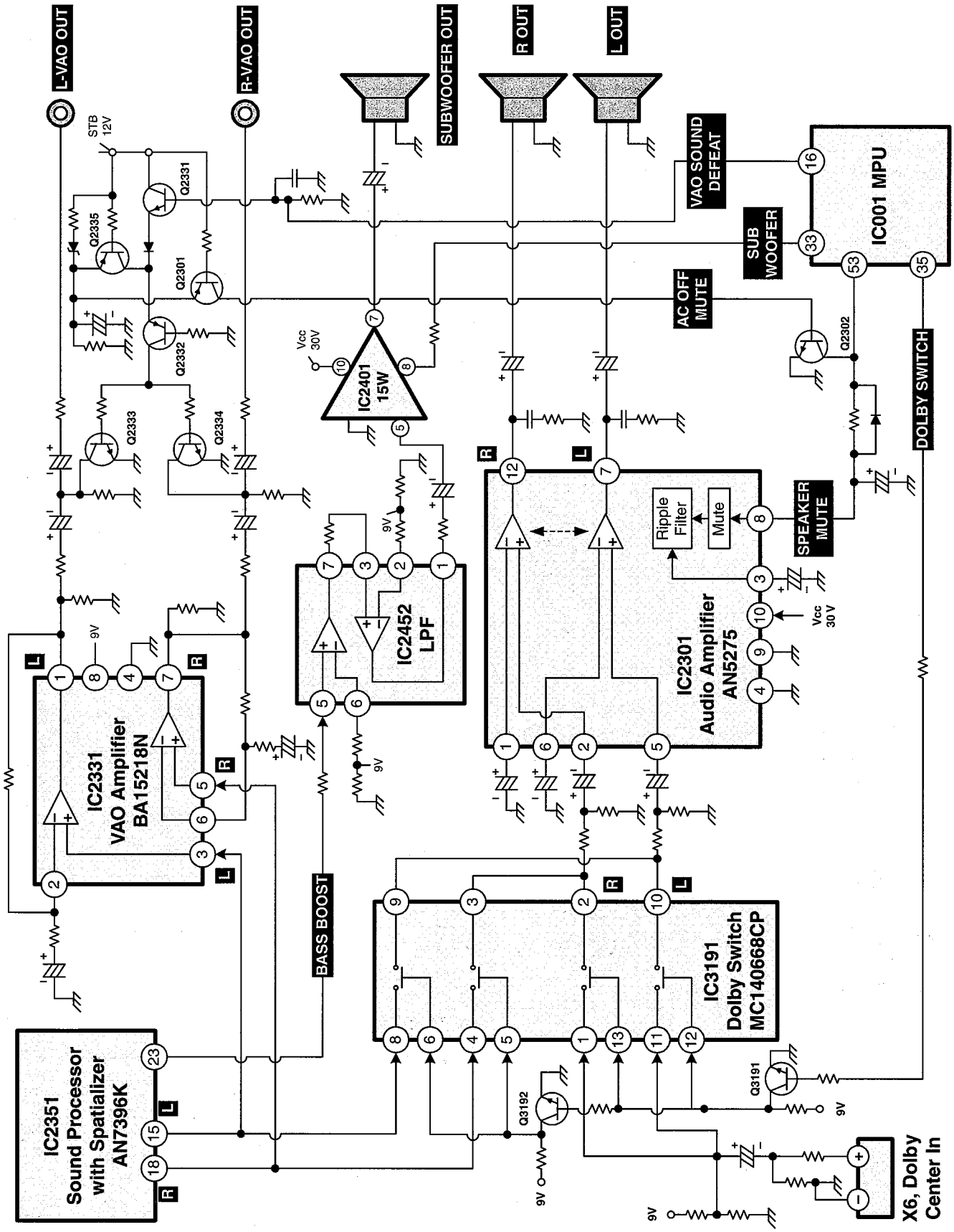


Figure 31. Audio Signal Path Block Diagram.

IC101 IN/OUT Pins and Functions (VJC)

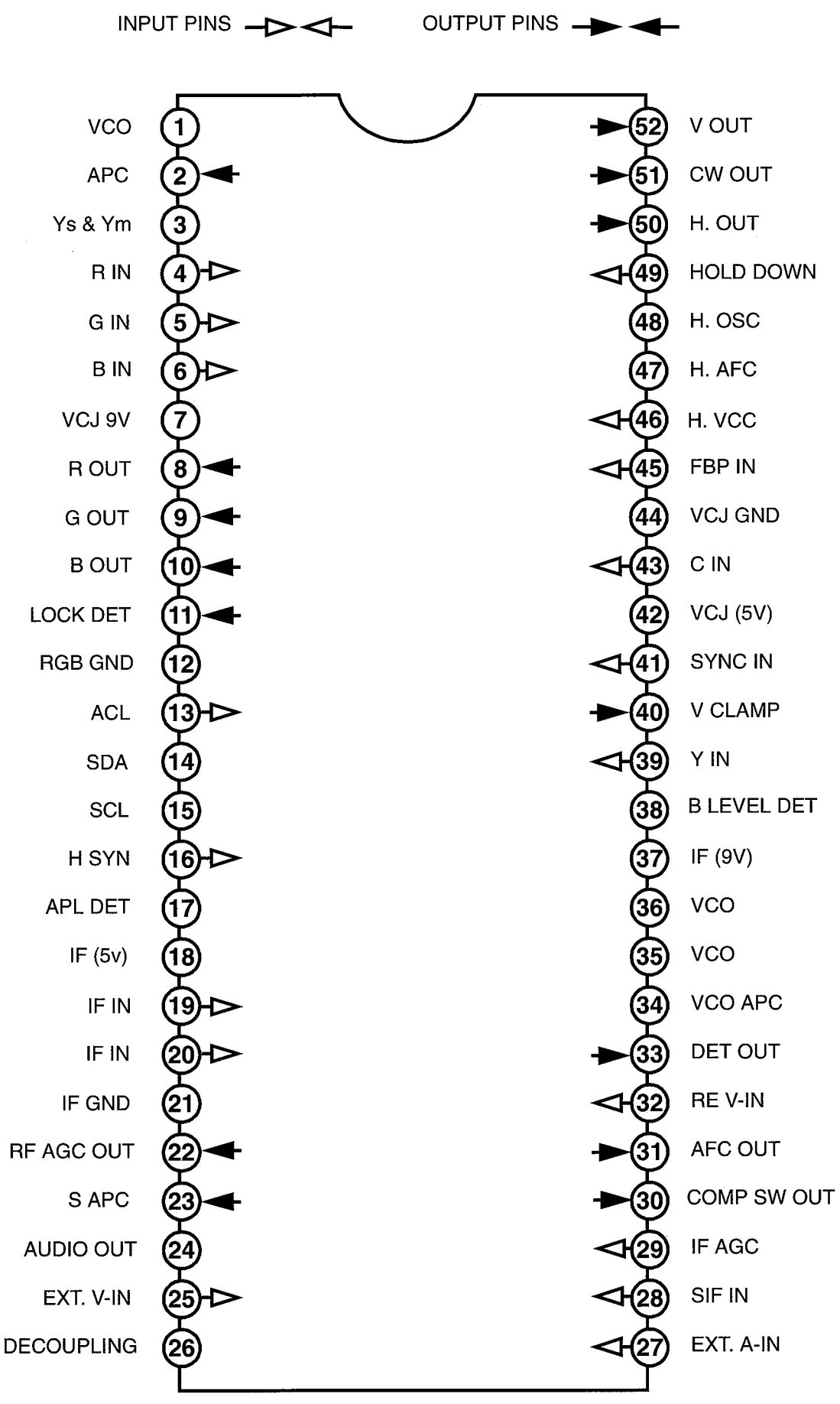


Figure 32. VCJ IN/OUT Pins and Functions.

IC001 IN/OUT Pins and Functions (MPU)

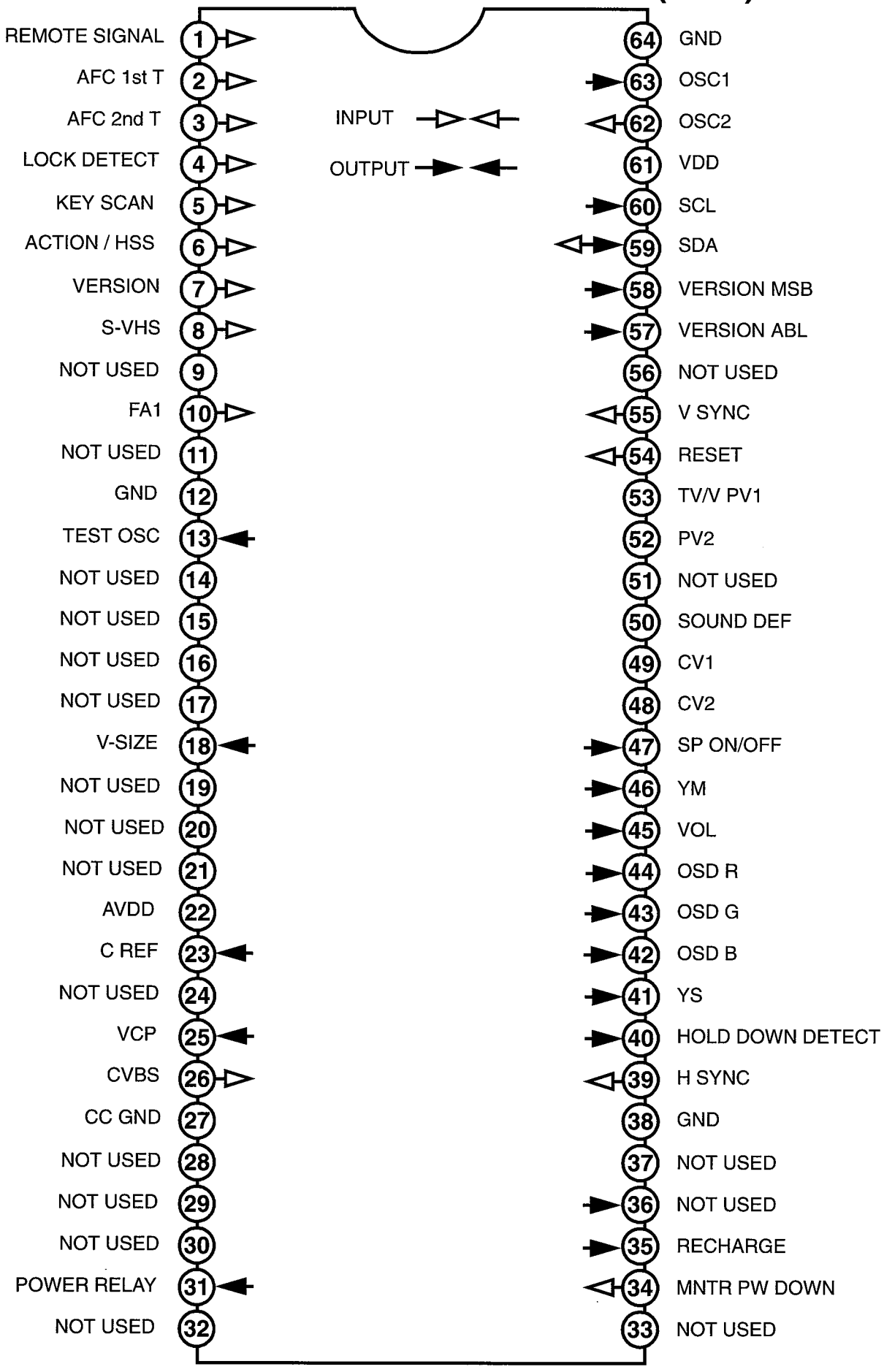


Figure 33. MPU IN/OUT Pins and Functions.

Identification of Components

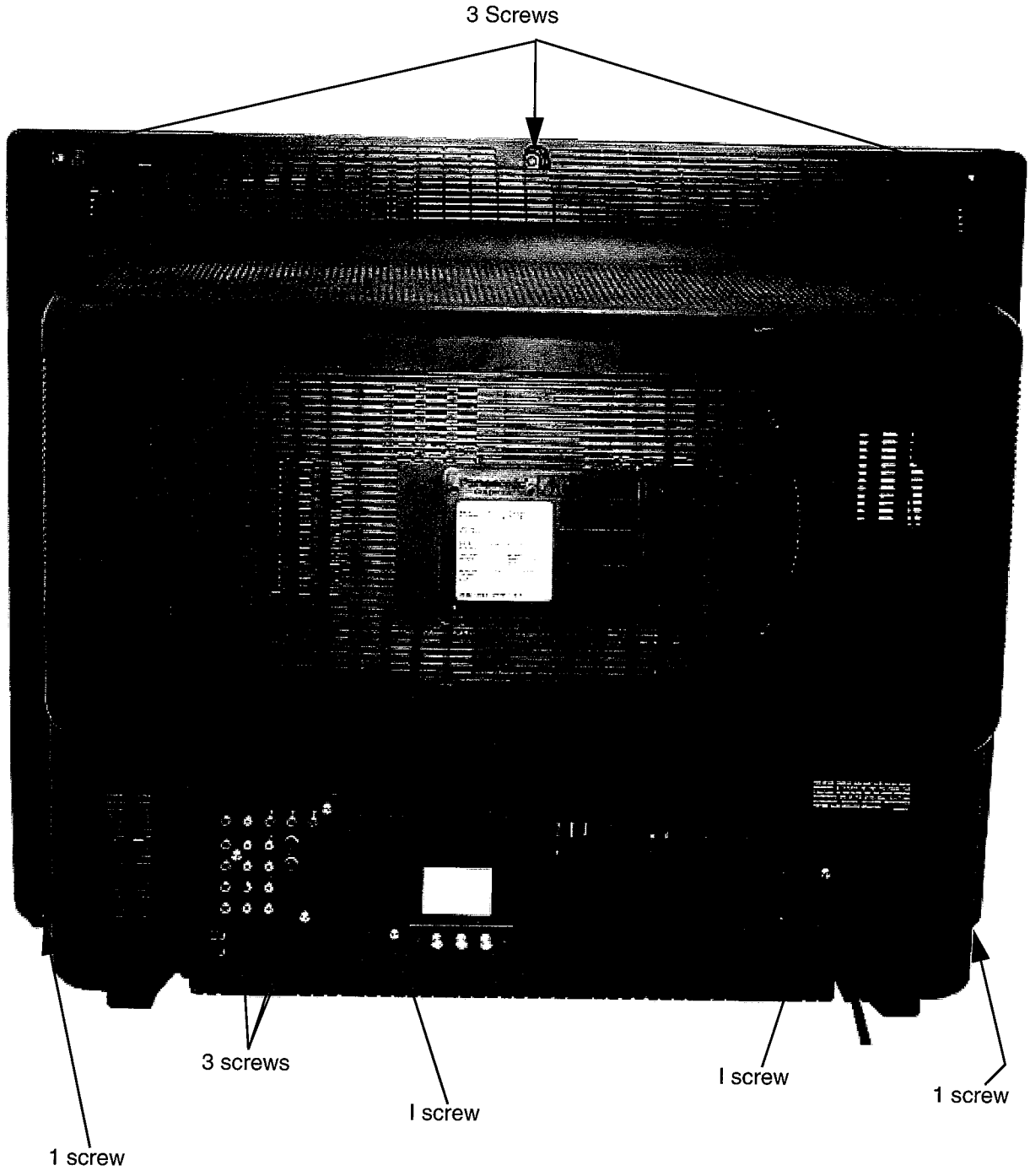


Figure 34. Back Removal - Location of Screws

Identification of Components

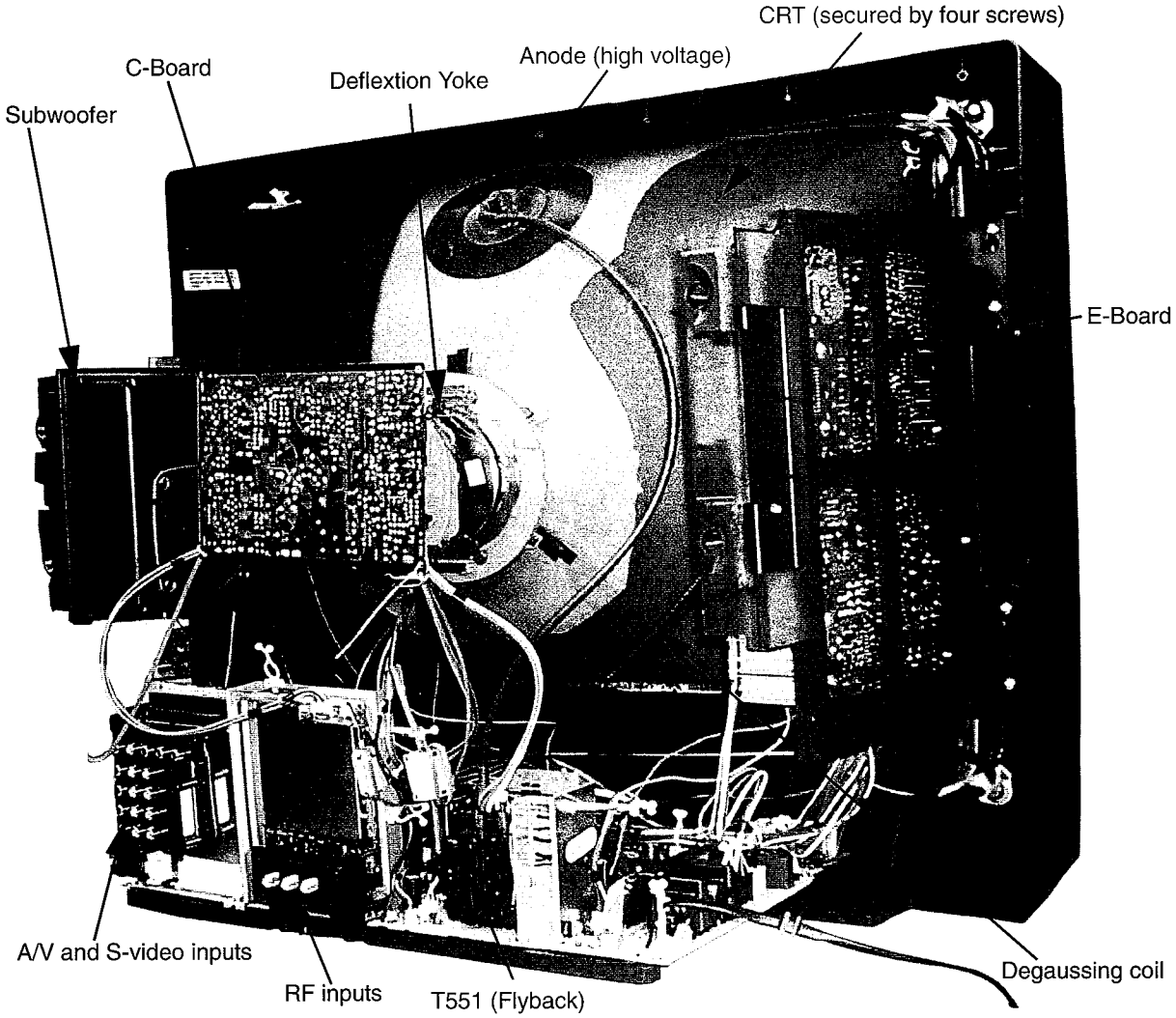


Figure 35. Rear View

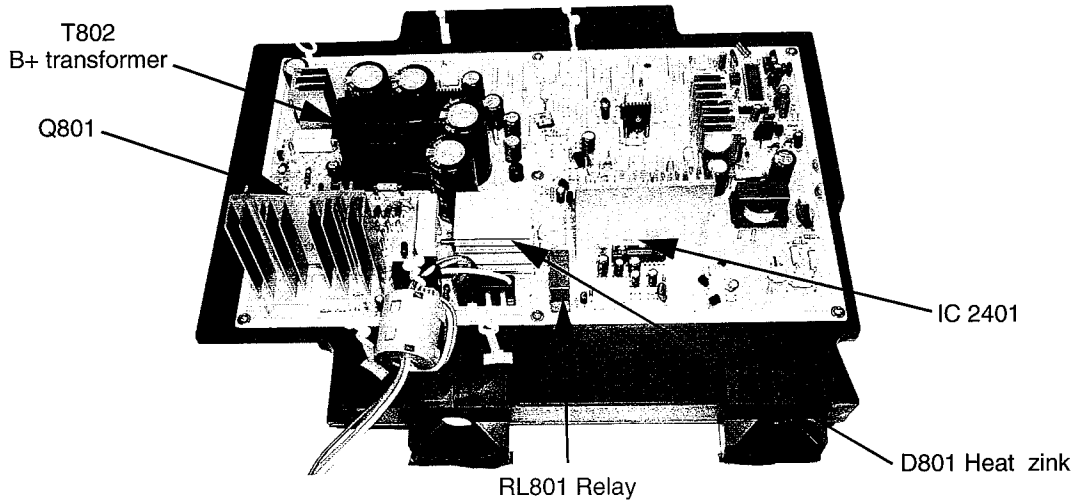


Figure 36. E-Board

Identification of Components

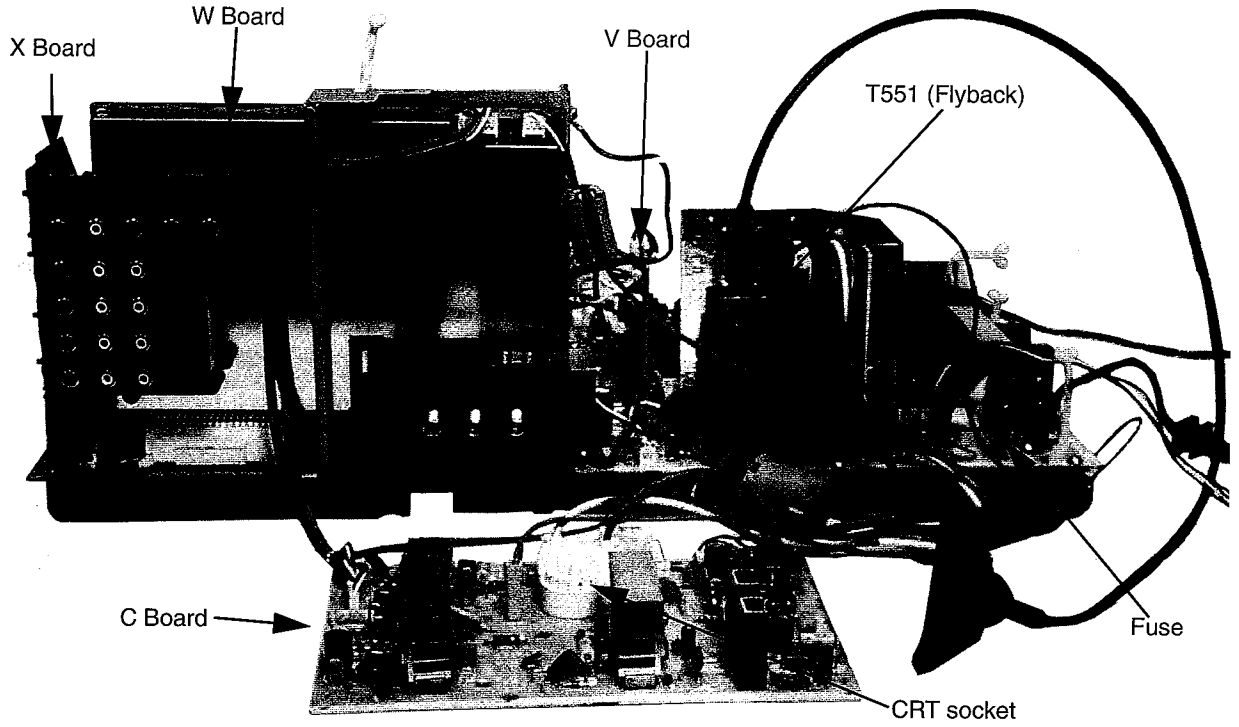


Figure 37. Rear View of Main Component Assembly

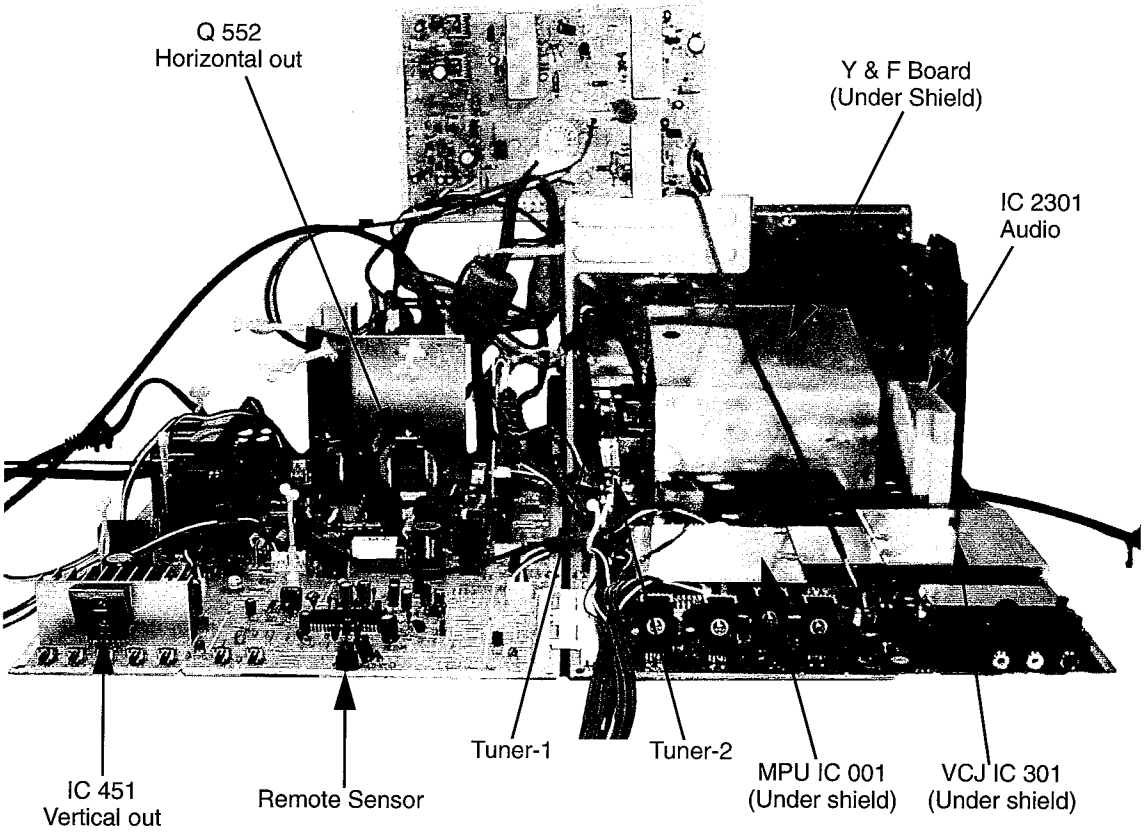


Figure 38. Front View of Main Component Assembly

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
	CAPRISTORS	
CR3801	**EXNG131P365**	**RES-CAP 130PF/3.6 MEG**
CR3802	**EXNG131P365**	**RES-CAP 130PF/3.6 MEG**
	CAPACITORS	
C001	ECA1CM101	CAP,E 100UF/16V
C004	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C005	ECA1CM101	CAP,E 100UF/16V
C006	ECA1HM4R7	CAP,E 4.7UF/50V
C010	ECA1VM470	CAP,E 47UF/35V
C011	ECUX1H101JCX	CAP,C 100PF-J-50V
C012	ECUX1H101JCX	CAP,C 100PF-J-50V
C013	ECA1HM220	CAP,E 22UF/50V
C014	ECA1HM220	CAP,E 22UF/50V
C015	ECUX1H181JCX	CAP,C 180PF-J-50V
C016	ECEA1HNR47U	CAP,E .47UF-50V
C017	EEANA1E1R0B	CAP,E 1.0UF-25V
C021	ECUX1H101JCX	CAP,C 100PF-J-50V
C023	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C024	ECA0JM102	CAP,E 1000UF/6.3V
C028	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C029	ECA1HM010	CAP,E 1.0UF/50V
C030	ECA1HM220	CAP,E 22UF/50V
C031	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C034	ECUX1H272KBX	CAP,C .0027UF-K-50V
C035	ECA1HM4R7	CAP,E 4.7UF/50V
C036	ECQB1H104JM	CAP,P .1UF-J-50V
C037	ECUX1H101JCX	CAP,C 100PF-J-50V
C038	ECUX1H101JCX	CAP,C 100PF-J-50V
C039	ECUX1H220JCX	CAP,C 22PF-J-50V
C040	ECUX1H270JCX	CAP,C 27PF-J-50V
C041	ECA0JM331	CAP,E 330UF/6.3V
C042	ECQB1H223JM	CAP,P .022UF-J-50V
C043	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C044	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C047	ECA0JM222	CAP,E 2200UF/6.3V
C048	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C050	ECA1CM102	CAP,E 1000UF/16V
C051	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C053	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C054	TCUX1H103KBN	CAP,C .01UF-K-50V
C055	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C060	ECA0JM101	CAP,E 100UF/6.3V
C061	ECA1HM010	CAP,E 1.0UF/50V
C063	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C064	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C082	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C083	ECEA1CFS470	CAP,E 47UF/16V
C084	TACCX103T50V	CAP,C .01UF/50V
C085	ECA1EM220	CAP,E 22UF/25V
C087	TACCX103T50V	CAP,C .01UF/50V
C088	TACCX103T50V	CAP,C .01UF/50V

REF NO.	PART NO.	DESCRIPTION
C101	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C103	ECEA1CKA330	CAP,E 33UF/16V
C104	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C105	ECA1HHGR22B	CAP,E .22UF-50V
C109	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C111	ECA1HHGR47B	CAP,E .47UF-50V
C112	ECUX1H270JCX	CAP,C 27PF-J-50V
C115	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C116	ECEA1CKA100	CAP,E 10UF/16V
C135	ECUX1H270JCX	CAP,C 27PF-J-50V
C140	ECUX1H300JCX	CAP,C 30PF-J-50V
C153	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C154	ECEA1HKAR22	CAP,E .22UF/50V
C202	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C207	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C208	ECUX1H101JCX	CAP,C 100PF-J-50V
C209	ECA1EM4R7	CAP,E 4.7UF/25V
C210	ECEA1CKA100	CAP,E 10UF/16V
C212	ECUX1H100DCX	CAP,C 10PF-D-50V
C301	ECEA1CN470U	CAP,E 47UF-16V
C304	ECA1HM010	CAP,E 1.0UF/50V
C305	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C307	ECJ2VF1H223Z	CAP,C .022UF-Z050V
C308	ECA1HM3R3	CAP,E 3.3UF/50V
C309	ECEA1HN010U	CAP,E 1UF/50V
C311	ECA1VM470	CAP,E 47UF/35V
C312	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C313	ECA1VM470	CAP,E 47UF/35V
C314	ECA1CM101	CAP,E 100UF/16V
C318	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C319	ECA1CM101	CAP,E 100UF/16V
C320	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C322	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C323	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C330	ECUX1H101JCX	CAP,C 100PF-J-50V
C357	ECKD2H821KB	CAP,C 820PF-K-500V
C361	ECEA1HN010U	CAP,E 1UF/50V
C366	ECKD2H332KB	CAP,C .0033UF-K-500V
C367	ECQM4103KZ	CAP,P .01UF-K-400V
C372	**ECA2EM100**	**CAP,E 10UF/250V**
C373	TACCX103T50V	CAP,C .01UF/50V
C374	ECA1CM470	CAP,E 47UF/16V
C375	ECA1CM221	CAP,E 220UF/16V
C376	ECKD2H102KB	CAP,C .001UF-K-500V
C377	ECQE2104KF	CAP,P .10UF-K-200V
C378	ECCF1H680JC	CAP,C 68PF-J-50V
C379	TACCX103T50V	CAP,C .01UF/50V
C380	ECA1HM010	CAP,E 1.0UF/50V
C381	ECA1CM470	CAP,E 47UF/16V
C382	TACCX223T50V	CAP,C .022UF/50V
C383	ECKD2H102KB	CAP,C .001UF-K-500V

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C384	ECQE2104KF	CAP,P .10UF-K-200V
C385	TACCX103T50V	CAP,C .01UF/50V
C386	ECA1HM010	CAP,E 1.0UF/50V
C387	TACCX223T50V	CAP,C .022UF/50V
C388	ECA1CM470	CAP,E 47UF/16V
C389	ECCF1H330JC	CAP,C 33PF-J-50V
C390	ECKD2H102KB	CAP,C .001UF-K-500V
C391	ECQE2104KF	CAP,P .10UF-K-200V
C392	ECCF1H820JC	CAP,C 82PF-J-50V
C393	TACCX223T50V	CAP,C .022UF/50V
C394	ECA1CM470	CAP,E 47UF/16V
C395	TACCX103T50V	CAP,C .01UF/50V
C396	ECA1HM010	CAP,E 1.0UF/50V
C398	ECKD3D332KB	CAP,C .0033UF-K-2KV
C401	TACCW331T50V	CAP,C 330PF/50V
C402	ECA1CM330	CAP,E 33UF/16V
C403	ECA1CM101	CAP,E 100UF/16V
C414	ECSF1EE475VB	CAP,E 4.7UF-25V
C416	EEANA1E1R0B	CAP,E 1.0UF-25V
C417	TACCX103T50V	CAP,C .01UF/50V
C418	ECQB1H224JF	CAP,P .22UF-J-50V
C419	ECSF1EE335VB	CAP,E 3.3UF-25V
C420	ECA1HM470	CAP,E 47UF/50V
C421	TACCX103T50V	CAP,C .01UF/50V
C422	ECA1HM470	CAP,E 47UF/50V
C423	TACCX103T50V	CAP,C .01UF/50V
C426	EEANA1E100B	CAP,E 10UF-25V
C429	ECA1HM3R3	CAP,E 3.3UF/50V
C451	ECA1HHG2R2B	CAP,E 2.2UF-50V
C452	ECQB1H473JM	CAP,P .047UF-J-50V
C453	ECA1VM471	CAP,E 470UF/35V
C454	ECA1VM221	CAP,E 220UF/35V
C455	ECA1VHG222E	CAP,E 2200UF-35V
C457	ECA1CM101	CAP,E 100UF/16V
C458	ECQM1104JZ	CAP,P .1UF-J-100V
C461	ECA1CM330	CAP,E 33UF/16V
C462	ECA1HM010	CAP,E 1.0UF/50V
C463	ECQB1H224JF	CAP,P .22UF-J-50V
C465	ECCF1H040CC	CAP,C 4PF-C-50V
C466	ECEA1CN220U	CAP,E 22UF-16V
C481	ECA1HM100	CAP,E 10UF/50V
C482	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C483	ECA1HM100	CAP,E 10UF/50V
C491	ECA1VM101	CAP,E 100UF/35V
C492	ECKF1H103KB	CAP,C .01UF-K-50V
C493	ECA1HM100	CAP,E 10UF/50V
C494	ECA1VM470	CAP,E 47UF/35V
C495	TACCX103T50V	CAP,C .01UF/50V
C497	TACCX103T50V	CAP,C .01UF/50V
C500	ECQB1H153JM	CAP,P .015UF-J-50V
C502	ECQE2683KF	CAP,P .068UF-K-200V

REF NO.	PART NO.	DESCRIPTION
C503	ECKD2H102KB	CAP,C .001UF-K-500V
C504	ECQB1H223JM	CAP,P .022UF-J-50V
C506	ECKD2H102KB	CAP,C .001UF-K-500V
C507	ECA1HM220	CAP,E 22UF/50V
C508	TACCX103T50V	CAP,C .01UF/50V
C509	**ECWH12H102JS**	**CAP,P .001UF-J-1.2KV**
C510	TACCQ221T50V	CAP,C 220PF/50V
C512	**ECWH12H222JS**	**CAP,P .0022UF-J-1.2KV**
C513	ECA1HM100	CAP,E 10UF/50V
C514	**ECQE10223KF**	**CAP,P .022UF-K-125V**
C515	ECA1CM100	CAP,E 10UF/16V
C518	ECQB1H332JM	CAP,P 3300PF-J-50V
C520	**ECQE1335KF**	**CAP,P 3.3UF-K-100V**
C531	**ECA1HM330**	**CAP,E 33UF/50V**
C532	**TACCX103T50V**	**CAP,C .01UF/50V**
C533	ECQB1H223JM	CAP,P .022UF-J-50V
C534	ECA1HM100	CAP,E 10UF/50V
C545	ECUX1H102JCX	CAP,C .001UF-J-50V
C548	ECQB1H222JM	CAP,P 2200PF-J-50V
C552	**ECWH15H102JN**	**CAP,P 1000PF-J-1.5KV**
C553	**ECQP1223JZ**	**CAP,P .022UF-J-100V**
C555	**ECWH15H622JN**	**CAP,P 6200PF-J-15KV**
C556	ECA1CM471	CAP,E 470UF/16V
C557	ECKD2H331KB	CAP,C 330PF-K-500V
C558	**ECA2EM330**	**CAP,E 33UF-250V**
C562	**ECA1VM471**	**CAP,E 470UF/35V**
C565	**ECQP1223JZ**	**CAP,P .022UF-J-100V**
C566	ECKD2H561KB	CAP,C 560PF-K-500V
C567	TACCW102T50V	CAP,C .001UF/50V
C572	**ECWH15H682JN**	**CAP,P 6800PF-J-1.5KV**
C573	**ECQF4123JZH**	**CAP,P .012UF-J-400V**
C574	**ECWF4105JBB**	**CAP,P 1UF-J-400V**
C575	**ECWF4824JBB**	**CAP,P .82UF-J-400V**
C581	**ECQF4103JZH**	**CAP,P .01UF-J-400V**
C583	ECA1VHG102E	CAP,E 1000UF/35V
C584	**ECKD3D821JB**	**CAP,C 820PF-J-2KV**
C590	TACCX103T50V	CAP,C .01UF/50V
C591	ECEA1HNR47U	CAP,E .47UF-50V
C595	ECQB1H223JM	CAP,P .022UF-J-50V
C596	ECQB1H223JM	CAP,P .022UF-J-50V
C597	TACCW472T50V	CAP,C .0047UF/50V
C598	TACCX103T50V	CAP,C .01UF/50V
C602	TCUX1H103KBN	CAP,C .01UF-K-50V
C603	TCUX1H103KBN	CAP,C .01UF-K-50V
C604	ECEA1HN2R2U	CAP,E 2.2UF/50V
C605	TCUX1H103KBN	CAP,C .01UF-K-50V
C607	ECUX1H090DCX	CAP,C 9PF-D-50V
C608	ECA1VM470	CAP,E 47UF/35V
C609	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C613	ECUX1H391JCX	CAP,C 390PF-J-50V
C614	ECJ2VF1H104Z	CAP,C .1UF-Z-50V

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C615	ECUX1H330JCX	CAP,C 33PF-J-50V
C616	TCUX1H103KBN	CAP,C .01UF-K-50V
C618	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C619	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C620	ECA1HMR33	CAP,E .33UF/50V
C621	ECA1HMR33	CAP,E .33UF/50V
C622	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C623	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C624	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C625	ECEA1HN100U	CAP,E 10UF/50V
C626	ECEA1HN100U	CAP,E 10UF/50V
C627	ECEA1HN100U	CAP,E 10UF/50V
C631	ECEA1HN100U	CAP,E 10UF/50V
C632	ECEA1HN100U	CAP,E 10UF/50V
C633	ECEA1HN100U	CAP,E 10UF/50V
C636	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C637	ECA1HM100	CAP,E 10UF/50V
C705	TACCW151T50V	CAP,C 150PF/50V
C711	ECQB1H272JM	CAP,P 2700PF-J-50V
C717	ECKD2H391KB	CAP,C 390PF-K-500V
C719	**ECKD2H561KB**	**CAP,C 560PF-K-500V**
C735	ECQM2104KZ	CAP,P .1UF-K-200V
C741	ECA1CM101	CAP,E 100UF/16V
C743	ECQB1H221JF	CAP,P 220PF-J-50V
C744	ECQB1H562JM	CAP,P 5600PF-J-50V
C747	ECA1HM4R7	CAP,E 4.7UF/50V
C750	ECKD2H471KB	CAP,C 470PF-K-500V
C751	ECKD2H561KB	CAP,C 560PF-K-500V
C752	ECKD2H103KB	CAP,C .01UF-K-500V
C753	ECQB1H222JM	CAP,P 2200PF-J-50V
C781	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C782	ECA1HM100	CAP,E 10UF/50V
C789	TACCW102T50V	CAP,C .001UF/50V
C802	**ECKD2H472PU**	**CAP,C .0047UF-P-500V**
C803	ECQB1H222JM	CAP,P 2200PF-J-50V
C804	**ECKD2H472PU**	**CAP,C .0047UF-P-500V**
C805	**ECKD2H472PU**	**CAP,C .0047UF-P-500V**
C806	**EC0S2DA821CB**	**CAP,E 820UF-200V**
C808	ECQB1H102JM	CAP,P 1000PF-J-50V
C809	ECQB1H333JM	CAP,P .033UF-J-50V
C810	ECQB1H222JM	CAP,P 2200PF-J-50V
C813	TACCQ101T50V	CAP,C 100PF/50V
C814	ECA1EHG221B	CAP,E 220UF-25V
C815	ECKD3A332KB	CAP,C .0033-10-1KV
C816	ECA1HM010	CAP,E 1.0UF/50V
C817	ECA1HM470	CAP,E 47UF/50V
C818	ECA1CM331	CAP,E 330UF/16V
C821	**EC0S2DA821CB**	**CAP,E 820UF-200V**
C822	ECQB1H393JM	CAP,P .039UF-J-50V
C823	ECA1HHG100B	CAP,E 10UF/50V
C825	ECA1CM101	CAP,E 100UF/16V

REF NO.	PART NO.	DESCRIPTION
C827	ECQB1H473JM	CAP,P .047UF-J-50V
C832	**ECKCNB472ME**	**CAP,C 4700PF-M-250V**
C840	ECA1CHG222E	CAP,E 2200UF/16V
C841	ECA1CHG222E	CAP,E 2200UF/16V
C842	ECKD3A471KB	CAP,C 470PF-K-1KV
C843	**ECA1VHG471B**	**CAP,E 470UF-35V**
C844	ECKD3A471KB	CAP,C 470PF-K-1KV
C845	**ECA1VHG471B**	**CAP,E 470UF-35V**
C846	**EC0S1EA103CB**	**CAP,E .01UF/25V**
C848	ECKD3A471KB	CAP,C 470PF-K-1KV
C849	**EC0S2CA821CB**	**CAP,E 820UF/160V**
C850	ECKD3D152KB	CAP,C .0015UF-K-2KV
C852	**ECKCNB472ME**	**CAP,C 4700PF-M-250V**
C853	TACCX103T50V	CAP,C .01UF/50V
C854	ECA2CM330	CAP,E 33UF-160V
C865	ECA1CM101	CAP,E 100UF/16V
C871	ECA1CM330	CAP,E 33UF/16V
C872	ECA1HM010	CAP,E 1.0UF/50V
C880	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C881	ECA1CM471	CAP,E 470UF/16V
C882	ECA1VM470	CAP,E 47UF/35V
C883	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C884	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C885	ECA1CM471	CAP,E 470UF/16V
C886	ECA1VM470	CAP,E 47UF/35V
C887	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C888	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C889	ECA1CM471	CAP,E 470UF/16V
C890	ECA1VM470	CAP,E 47UF/35V
C891	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C892	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C893	ECA1CM471	CAP,E 470UF/16V
C894	ECA1VM470	CAP,E 47UF/35V
C895	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C896	ECA1HM100	CAP,E 10UF/50V
C897	ECA1CM101	CAP,E 100UF/16V
C898	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C899	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C901	ECEA1CN100U	CAP,E 10UF-16V
C902	ECA1CM101	CAP,E 100UF/16V
C907	ECCF1H560J	CAP,C 56PF-J-50V
C908	TACCW101T50V	CAP,C 100PF/50V
C909	ECKD2H472MD	CAP,C .0047UF-M-500V
C910	ECKD2H472MD	CAP,C .0047UF-M-500V
C911	TACCW101T50V	CAP,C 100PF/50V
C920	TACCW121T50V	CAP,C 120PF/50V
C931	TACCW103T50V	CAP,C .01UF/50V
C932	ECA1CM101	CAP,E 100UF/16V
C956	ECKD2H102KB	CAP,C .001UF-K-500V
C958	**ECA2CM330**	**CAP,E 33UF-160V**
C961	**ECA2CM100**	**CAP,E 10UF-160V**

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C964	ECA1CHG101B	CAP,E 100UF-16V
C965	ECCD2H560J	CAP,C 56PF-J-500V
C966	ECA1CHG101B	CAP,E 100UF-16V
C972	TACCW101T50V	CAP,C 100PF/50V
C1401	ECJ2VB1H333K	CAP,C .033UF-K-50V
C1402	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1403	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1404	ECA1HM010	CAP,E 1.0UF/50V
C1407	ECA1CM221	CAP,E 220UF/16V
C1510	ECQV1H334JM	CAP,P .33UF-J-50V
C1546	ECQB1H103JM	CAP,P .01UF-J-50V
C1549	ECA1CM101	CAP,E 100UF/16V
C1551	ECUX1H182JCX	CAP,C .0018UF-J-50V
C1552	ECQB1H333JM	CAP,P .033UF-J-50V
C1553	ECA1HM4R7	CAP,E 4.7UF/50V
C1554	ECUX1H221JUX	CAP,C 220PF-J-50V
C1555	ECQB1H563JM	CAP,P .056UF-J-50V
C1557	ECUX1H101JCX	CAP,C 100PF-J-50V
C1560	ECUX1H471JCX	CAP,C 470PF-J-50V
C1561	ECEA1HN010U	CAP,E 1UF/50V
C1562	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1563	ECA1HMR47	CAP,E .47UF/50V
C1564	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1565	ECA1HMR47	CAP,E .47UF/50V
C1566	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1567	ECUX1H151JCX	CAP,C 150PF-J-50V
C1568	ECUX1H101JCX	CAP,C 100PF-J-50V
C1569	ECQB1H471JF	CAP,P .0047UF-J-50V
C1570	ECQB1H471JF	CAP,P .0047UF-J-50V
C1571	ECQB1H471JF	CAP,P .0047UF-J-50V
C1572	ECA1CM101	CAP,E 100UF/16V
C1573	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1574	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1575	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1578	ECQB1H331KF	CAP,P 330PF-K-50V
C1590	ECUX1H821JCX	CAP,C 820PF-J-50V
C1591	ECUX1H392KBX	CAP,C .0039UF-K-50V
C1592	ECUX1H561JCX	CAP,C 560PF-J-50V
C1701	ECA1CM101	CAP,E 100UF/16V
C1702	ECQB1H103JM	CAP,P .01UF-J-50V
C1703	ECQB1H333JM	CAP,P .033UF-J-50V
C1704	ECQB1H223JM	CAP,P .022UF-J-50V
C1705	ECQV1H394JM	CAP,P .39UF-J-50VDC
C1706	ECA1HM330	CAP,E 33UF/50V
C1707	ECQB1H154JF	CAP,P .15UF-J-50V
C1708	TACCQ181T50V	CAP,C 180PF/50V
C1709	TACCW221T50V	CAP,C 220PF/50V
C1710	TACCQ330T50V	CAP,C 33PF/50V
C1711	ECCF1H820JC	CAP,C 82PF-J-50V
C1712	ECA1HM100	CAP,E 10UF/50V
C1713	ECA1HM010	CAP,E 1.0UF/50V

REF NO.	PART NO.	DESCRIPTION
C1714	ECQB1H821JF	CAP,P 820PF-J-50V
C1715	ECA1HM010	CAP,E 1.0UF/50V
C1716	ECQB1H103JM	CAP,P .01UF-J-50V
C1717	ECQB1H104JM	CAP,P .1UF-J-50V
C1718	ECCF1H560JC	CAP,C 56PF-J-50V
C1719	ECQB1H103JM	CAP,P .01UF-J-50V
C1720	ECEA1EN330U	CAP,E 33UF-25V
C1721	ECQB1H103JM	CAP,P .01UF-J-50V
C1722	ECA1CM101	CAP,E 100UF/16V
C1723	ECQB1H103JM	CAP,P .01UF-J-50V
C1724	ECA1CM101	CAP,E 100UF/16V
C1725	ECQB1H103JM	CAP,P .01UF-J-50V
C1727	ECA1HHG4R7B	CAP,E 4.7UF-50V
C1728	TACCW471T50V	CAP,C 470PF/50V
C1729	TACCQ150T50V	CAP,C 15PF/50V
C1730	**ECA2EHG220B**	**CAP,E 22UF-250V**
C1731	ECA2EHG220B	CAP,E 22UF-250V
C1732	ECKD3A222KB	CAP,C 2200PF-K-1KV
C1733	ECA1HM100	CAP,E 10UF/50V
C1735	ECQB1H104JM	CAP,P .1UF-J-50V
C1801	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1802	ECQV1H154JM	CAP,P .15UF-J-50V
C1803	ECEA1HKAR22	CAP,E .22UF/50V
C1804	ECEA1HKAR22	CAP,E .22UF/50V
C1805	ECJ2VF1H333Z	CAP,C .033UF-Z-50V
C1806	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1807	ECEA1CKA470	CAP,E 47UF/16V
C1808	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1809	ECEA1CKA470	CAP,E 47UF/16V
C1810	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1811	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1812	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1813	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1814	ECEA1CKA470	CAP,E 47UF/16V
C1815	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1816	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1817	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1818	ECEA1CKA100	CAP,E 10UF/16V
C1819	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1820	ECEA1CKA470	CAP,E 47UF/16V
C1821	ECUX1H150JCX	CAP,C 15PF-J-50V
C1822	ECUX1H120JCX	CAP,C 12PF-J-50V
C1823	ECUX1H680JCX	CAP,C 68PF-J-50V
C1826	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1827	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1828	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C1829	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1830	ECUX1H560JCX	CAP,C 56PF-J-50V
C1831	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1832	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1833	ECJ2VF1H104Z	CAP,C .1UF-Z-50V

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C1835	ECEA1CKA100	CAP,E 10UF/16V
C1836	ECUX1H680JCX	CAP,C 68PF-J-50V
C1837	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1839	ECUX1H680JCX	CAP,C 68PF-J-50V
C1840	ECUX1H680JCX	CAP,C 68PF-J-50V
C2101	ECA1CM101	CAP,E 100UF/16V
C2105	ECA1CM101	CAP,E 100UF/16V
C2106	ECA1HM4R7	CAP,E 4.7UF/50V
C2108	ECA1CM101	CAP,E 100UF/16V
C2109	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2111	ECA1HHGR22B	CAP,E .22UF-50V
C2115	ECA1HM100	CAP,E 10UF/50V
C2116	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2117	ECUX1H270JCX	CAP,C 27PF-J-50V
C2118	ECUX1H270JCX	CAP,C 27PF-J-50V
C2119	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2120	ECA1HHGR47B	CAP,E .47UF-50V
C2121	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2123	ECUX1H270JCX	CAP,C 27PF-J-50V
C2124	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2126	ECA1HMR22	CAP,E .22UF/50V
C2130	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2201	AP335K016CAE	CAP,T 3.3UF/16V
C2202	ECEA1EKA4R7	CAP,E 4.7UF/25V
C2203	ECEA1HKA010	CAP,E 1.0UF/50V
C2204	ECEA1EKA4R7	CAP,E 4.7UF/25V
C2205	ECEA1EKA4R7	CAP,E 4.7UF/25V
C2206	ECEA1EKA4R7	CAP,E 4.7UF/25V
C2207	ECA1EM4R7	CAP,E 4.7UF/25V
C2208	ECEA1EKA4R7	CAP,E 4.7UF/25V
C2210	ECEA1HKAR33	CAP,E .33UF/50V
C2211	ECEA1HUR68	CAP,E .68UF/50V
C2212	ECA1HM2R2	CAP,E 2.2UF/50V
C2213	ECEA1HKA100	CAP,E 10UF/50V
C2214	ECQB1H104JM	CAP,P .1UF-J-50V
C2215	ECQB1H223JM	CAP,P .022UF-J-50V
C2216	ECUX1H332KBX	CAP,C .0033UF-K-50V
C2219	AP106K016CAE	CAP,T 10UF/16V
C2220	ECEA1CKA100	CAP,E 10UF/16V
C2221	ECUX1H101JCX	CAP,C 100PF-J-50V
C2222	**ECUX1H472KBX**	**CAP,C .0047UF-K-50V**
C2223	**TCUX1H103KBN**	**CAP,C .01UF-K-50V**
C2231	ECEA1CKA101	CAP,E 100UF/16V
C2232	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2301	ECA1EM101	CAP,E 100UF/25V
C2302	ECA1HM010	CAP,E 1.0UF/50V
C2305	ECA1HM010	CAP,E 1.0UF/50V
C2306	ECA1EM101	CAP,E 100UF/25V
C2307	ECA1EM102	CAP,E 1000UF/25V
C2308	ECA1HM330	CAP,E 33UF/50V
C2309	ECQB1H104JM	CAP,P .1UF-J-50V

REF NO.	PART NO.	DESCRIPTION
C2310	ECQB1H104JM	CAP,P .1UF-J-50V
C2311	ECA1HM100	CAP,E 10UF/50V
C2312	ECA1EM102	CAP,E 1000UF/25V
C2313	ECA1VM102	CAP,E 1000UF/35V
C2314	ECA1CM101	CAP,E 100UF/16V
C2316	ECA1HMR33	CAP,E .33UF/50V
C2319	ECA1HM0R1	CAP,E 0.1UF/50V
C2331	ECA1HM010	CAP,E 1.0UF/50V
C2332	ECA1HM010	CAP,E 1.0UF/50V
C2333	ECA1HM100	CAP,E 10UF/50V
C2334	ECA1HM100	CAP,E 10UF/50V
C2335	ECA1HM010	CAP,E 1.0UF/50V
C2336	ECA1HM010	CAP,E 1.0UF/50V
C2337	ECA1VM470	CAP,E 47UF/35V
C2351	ECJ2VB1E473K	CAP,C .047UF-K-25V
C2352	ECJ2VB1E473K	CAP,C .047UF-K-25V
C2353	ECA1HM100	CAP,E 10UF/50V
C2354	EEANA1E100B	CAP,E 10UF-25V
C2355	ECA1HM100	CAP,E 10UF/50V
C2356	ECA1HM100	CAP,E 10UF/50V
C2357	ECA1HM100	CAP,E 10UF/50V
C2358	ECUX1H153KBX	CAP,C .015UF-K-50V
C2359	ECA1HM0R1	CAP,E 0.1UF/50V
C2360	ECA1HM100	CAP,E 10UF/50V
C2361	ECA1HM100	CAP,E 10UF/50V
C2364	ECA1HM100	CAP,E 10UF/50V
C2365	ECA1HM100	CAP,E 10UF/50V
C2366	ECUX1H153KBX	CAP,C .015UF-K-50V
C2367	ECA1HM0R1	CAP,E 0.1UF/50V
C2369	ECA1AM330	CAP,E 33UF/10V
C2373	TCUX1H103KBN	CAP,C .01UF-K-50V
C2374	ECA1HM100	CAP,E 10UF/50V
C2375	ECEA1CN220U	CAP,E 22UF-16V
C2380	EEANA1E100B	CAP,E 10UF-25V
C2382	ECA1AM101	CAP,E 100UF/10V
C2388	ECJ2VB1C104K	CAP,C .1UF-I-16V
C2401	ECA1EM101	CAP,E 100UF/25V
C2405	ECA1HM010	CAP,E 1.0UF/50V
C2406	ECA1EM101	CAP,E 100UF/25V
C2407	ECA1EM102	CAP,E 1000UF/25V
C2408	ECA1HM220	CAP,E 22UF/50V
C2409	ECQB1H104JM	CAP,P .1UF-J-50V
C2411	ECA1HM100	CAP,E 10UF/50V
C2413	**ECA1VM102**	**CAP,E 1000UF/35V**
C2431	ECA1CM101	CAP,E 100UF/16V
C2471	ECEA1CKA101	CAP,E 100UF/16V
C2472	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C2476	ECQB1H473JM	CAP,P .047UF-J-50V
C2477	ECQB1H473JM	CAP,P .047UF-J-50V
C2478	ECQB1H473JM	CAP,P .047UF-J-50V
C2479	ECQB1H473JM	CAP,P .047UF-J-50V

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C2480	ECEA1CKA101	CAP,E 100UF/16V
C2601	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2602	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2603	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2604	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2605	ECEA1CKA100	CAP,E 10UF/16V
C2606	TCUY1C105ZFN	CAP,C 1UF-Z-16V
C2607	TCUY1C105ZFN	CAP,C 1UF-Z-16V
C2608	TCUY1C105ZFN	CAP,C 1UF-Z-16V
C2609	TCUY1C105ZFN	CAP,C 1UF-Z-16V
C2610	TCUY1C105ZFN	CAP,C 1UF-Z-16V
C2611	TCUY1C105ZFN	CAP,C 1UF-Z-16V
C2612	ECEA1CKA100	CAP,E 10UF/16V
C2613	ECEA1CKA220	CAP,E 22UF/16V
C2614	ECEA1HKA4R7	CAP,E 4.7UF/50V
C2615	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2616	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2617	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2618	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2619	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2620	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2621	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2623	ECEA1CKA220	CAP,E 22UF/16V
C2625	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C2631	ECEA1CKA101	CAP,E 100UF/16V
C2632	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2633	ECEA1CKA101	CAP,E 100UF/16V
C2634	ECEA1CKA101	CAP,E 100UF/16V
C2635	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C2636	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2637	ECUX1H271JCX	CAP,C 270PF-J-50V
C2638	ECUX1H271JCX	CAP,C 270PF-J-50V
C2639	ECUX1H271JCX	CAP,C 270PF-J-50V
C2644	ECEA1CKA470	CAP,E 47UF/16V
C2645	ECEA1CKA470	CAP,E 47UF/16V
C2646	ECEA1CKA470	CAP,E 47UF/16V
C2652	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2655	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2656	TCUY1C105ZFN	CAP,C 1UF-Z-16V
C2657	TCUY1C105ZFN	CAP,C 1UF-Z-16V
C2659	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2660	ECJ2VF1H333Z	CAP,C .033UF-Z-50V
C2662	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2663	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C2664	TCUY1C225ZFN	CAP,C 2.2UF-Z-16V
C2665	ECUX1H331JCX	CAP,C 330PF-J-50V
C2666	ECEA1CKA101	CAP,E 100UF/16V
C2667	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2668	TCUY1C105ZFN	CAP,C 1UF-Z-16V
C2670	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2672	ECUX1H820JCX	CAP,C 82PF-J-50V

REF NO.	PART NO.	DESCRIPTION
C2673	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2674	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2675	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2676	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2678	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2679	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2681	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2686	ECEA1CKA101	CAP,E 100UF/16V
C2687	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2688	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2691	TCUY1C225ZFN	CAP,C 2.2UF-Z-16V
C2692	TCUY1C225ZFN	CAP,C 2.2UF-Z-16V
C2693	TCUY1C225ZFN	CAP,C 2.2UF-Z-16V
C2694	TCUY1C225ZFN	CAP,C 2.2UF-Z-16V
C2695	TCUY1C225ZFN	CAP,C 2.2UF-Z-16V
C2696	TCUY1C225ZFN	CAP,C 2.2UF-Z-16V
C2697	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2701	ECEA1CKA100	CAP,E 10UF/16V
C2704	ECEA1CKA100	CAP,E 10UF/16V
C2707	ECEA1CKA100	CAP,E 10UF/16V
C2710	ECUX1H221JCX	CAP,C 220PF-J-50V
C2712	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C2721	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C2723	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C2724	ECEA1HKA010	CAP,E 1.0UF/50V
C2851	ECKD3A471KB	CAP,C 470PF-K-1KV
C2852	**ECA1VHG222E**	**CAP,E 2200UF-35V**
C3001	ECEA1CKA470	CAP,E 47UF/16V
C3002	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C3003	ECEA1HN010U	CAP,E 1UF/50V
C3004	ECEA1CKA470	CAP,E 47UF/16V
C3006	ECEA1CKA100	CAP,E 10UF/16V
C3007	ECEA1CKA100	CAP,E 10UF/16V
C3008	ECEA1HKA010	CAP,E 1.0UF/50V
C3009	ECEA1HKA010	CAP,E 1.0UF/50V
C3051	ECEA1CKA220	CAP,E 22UF/16V
C3052	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C3053	ECEA1CKA470	CAP,E 47UF/16V
C3054	ECA1CM471	CAP,E 470UF/16V
C3071	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C3072	ECEA1CKA100	CAP,E 10UF/16V
C3073	ECEA1CKA100	CAP,E 10UF/16V
C3074	ECEA1HKA010	CAP,E 1.0UF/50V
C3075	ECEA1HKA010	CAP,E 1.0UF/50V
C3076	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C3077	ECEA1CKA100	CAP,E 10UF/16V
C3078	ECEA1CKA100	CAP,E 10UF/16V
C3079	ECEA1HKA010	CAP,E 1.0UF/50V
C3080	ECEA1HKA010	CAP,E 1.0UF/50V
C3083	ECEA1CKA100	CAP,E 10UF/16V
C3084	ECEA1HKA010	CAP,E 1.0UF/50V

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C3085	ECEA1HKA010	CAP,E 1.0UF/50V
C3091	ECEA1HKA010	CAP,E 1.0UF/50V
C3092	ECEA1HKA010	CAP,E 1.0UF/50V
C3101	ECEA1CKA220	CAP,E 22UF/16V
C3102	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C3103	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C3104	ECA1HM100	CAP,E 10UF/50V
C3106	ECEA1CKA220	CAP,E 22UF/16V
C3107	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C3108	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C3111	ECEA1CKA220	CAP,E 22UF/16V
C3112	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C3113	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C3192	ECA1HM010	CAP,E 1.0UF/50V
C3451	ECA1HM100	CAP,E 10UF/50V
C3452	TCUX1H103KBN	CAP,C .01UF-K-50V
C3453	ECA1HM100	CAP,E 10UF/50V
C3454	ECA1HM010	CAP,E 1.0UF/50V
C3455	ECA1HM010	CAP,E 1.0UF/50V
C3811	ECQU2A224MV	CAP,P .22UF-M-250VAC
C3824	ECA1CM472	CAP,E 4700UF-16V
C3829	ECA1CM101	CAP,E 100UF/16V
C4301	ECKF1H103ZF	CAP,C .01UF-Z-50V
C4302	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C4303	ECUX1H101JCX	CAP,C 100PF-J-50V
C4304	ECEA1CKA100	CAP,E 10UF/16V
C4307	ECEA1CKN100	CAP,E 10UF/16V
C4313	ECUX1H391KBX	CAP,C 390PF-K-50V
C4314	ECEA1HKAR47	CAP,E .47UF/50V
C4315	ECUX1H152KBX	CAP,C .0015UF-K-50V
C4316	ECEA0JKA331	CAP,E 330UF/6.3V
C4317	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C4318	ECEA1CKA470	CAP,E 47UF/16V
C4319	ECUX1H391JCX	CAP,C 390PF-J-50V
C4320	ERJ6GEYJ103	RES,M 10K-J-1/10
C6501	ECEA1CKA470	CAP,E 47UF/16V
C6502	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6503	ECEA1CKA470	CAP,E 47UF/16V
C6504	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6505	ECUX1H150JCX	CAP,C 15PF-J-50V
C6506	TCUX1H103KBN	CAP,C .01UF-K-50V
C6507	ECUX1H680JCX	CAP,C 68PF-J-50V
C6508	ECUX1H330JCX	CAP,C 33PF-J-50V
C6509	ECUX1H121JCX	CAP,C 120PF-J-50V
C6511	ECUX1H120JCX	CAP,C 12PF-J-50V
C6513	ECUX1H120JCX	CAP,C 12PF-J-50V
C6514	ECEA1HKA3R3	CAP,E 3.3UF/50V
C6515	ECUX1H330JCX	CAP,C 33PF-J-50V
C6516	TCUX1H103KBN	CAP,C .01UF-K-50V
C6517	ECEA1HN3R3U	CAP,E 3.3UF-50V
C6519	ECUX1H101JCX	CAP,C 100PF-J-50V

REF NO.	PART NO.	DESCRIPTION
C6520	ECEA1CKA100	CAP,E 10UF/16V
C6521	ECEA1HN4R7U	CAP,E 4.7UF/50V
C6522	TCUX1H103KBN	CAP,C .01UF-K-50V
C6523	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6524	ECEA1CKA470	CAP,E 47UF/16V
C6525	ECEA1CKA470	CAP,E 47UF/16V
C6526	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6527	ECEA1CKA470	CAP,E 47UF/16V
C6528	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6529	ECEA1CKA470	CAP,E 47UF/16V
C6530	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6531	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6532	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6533	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C6534	TCUX1H103KBN	CAP,C .01UF-K-50V
C6535	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C6536	ECEA1CKA470	CAP,E 47UF/16V
C6537	ECEA1HKA010	CAP,E 1.0UF/50V
C6538	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6539	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C6540	ECEA1CKA470	CAP,E 47UF/16V
C6541	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6542	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6543	TCUX1H103KBN	CAP,C .01UF-K-50V
C6544	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C6545	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6546	ECEA1CKA470	CAP,E 47UF/16V
C6547	ECUX1H222KBX	CAP,C .0022UF-K-50V
C6548	ECEA1HKA010	CAP,E 1.0UF/50V
C6549	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C6551	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6552	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6553	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6554	ECEA1CKA470	CAP,E 47UF/16V
C6555	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6556	ECEA1CKA470	CAP,E 47UF/16V
C6557	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6558	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6559	EEANA1E100B	CAP,E 10UF-25V
C6560	TCUX1H103KBN	CAP,C .01UF-K-50V
C6561	ECUX1H121JCX	CAP,C 120PF-J-50V
C6580	ECA1HM100	CAP,E 10UF/50V
C6581	ECA1CM101	CAP,E 100UF/16V
C6582	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C6583	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C8001	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8002	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8003	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8004	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8005	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8006	ECJ2VF1H104Z	CAP,C .1UF-Z-50V

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C8007	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8008	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8009	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8010	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8011	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8012	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8013	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8014	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8015	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8016	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8017	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8018	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8019	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8020	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8021	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8022	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8023	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8024	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8025	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8026	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8027	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8028	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8029	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8031	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C8032	ECJ2YB1H823K	CAP,C .082-K-50V
C8033	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C8034	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C8035	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C8036	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C8041	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8042	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8043	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8044	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8045	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8046	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8047	TCUX1H103ZFN	CAP,C .01UF-Z-50V
C8048	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8049	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8050	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8051	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8052	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8053	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8054	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8055	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8061	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8062	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8063	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8064	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8065	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8066	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8067	ECJ2VF1H104Z	CAP,C .1UF-Z-50V

REF NO.	PART NO.	DESCRIPTION
C8068	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8071	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8072	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8073	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8074	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8075	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8076	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8081	ECEA1CKA100	CAP,E 10UF/16V
C8082	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8084	ECEA1CKA100	CAP,E 10UF/16V
C8085	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8086	ECEA1CKA100	CAP,E 10UF/16V
C8087	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8088	ECEA1CKA100	CAP,E 10UF/16V
C8089	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8090	ECEA1CKA100	CAP,E 10UF/16V
C8091	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8092	ECEA1CKA100	CAP,E 10UF/16V
C8093	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8094	ECEA1CKA100	CAP,E 10UF/16V
C8095	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8098	ECEA1CKA100	CAP,E 10UF/16V
C8099	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8102	ECEA1CKA100	CAP,E 10UF/16V
C8103	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8104	ECEA1CKA100	CAP,E 10UF/16V
C8105	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8110	ECEA1CKA100	CAP,E 10UF/16V
C8111	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8112	ECEA1CKA100	CAP,E 10UF/16V
C8113	ECEA1CKA100	CAP,E 10UF/16V
C8114	ECEA1CKA100	CAP,E 10UF/16V
C8116	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8117	ECUX1H180JCX	CAP,C 18PF-J-50V
C8118	ECUX1H180JCX	CAP,C 18PF-J-50V
C8119	ECUX1H180JCX	CAP,C 18PF-J-50V
C8121	ECEA1CKA100	CAP,E 10UF/16V
C8122	ECUX1H180JCX	CAP,C 18PF-J-50V
C8123	ECUX1H560JCX	CAP,C 56PF-J-50V
C8124	ECUX1H181JCX	CAP,C 180PF-J-50V
C8125	ECUX1H150JCX	CAP,C 15PF-J-50V
C8126	ECEA1CKN100	CAP,E 10UF/16V
C8127	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8131	ECEA1CKA100	CAP,E 10UF/16V
C8132	ECUX1H180JCX	CAP,C 18PF-J-50V
C8133	ECUX1H560JCX	CAP,C 56PF-J-50V
C8134	ECUX1H181JCX	CAP,C 180PF-J-50V
C8135	ECUX1H150JCX	CAP,C 15PF-J-50V
C8136	ECEA1CKN100	CAP,E 10UF/16V
C8137	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8141	ECEA1CKA100	CAP,E 10UF/16V

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

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REF NO.	PART NO.	DESCRIPTION
C8142	ECUX1H180JCX	CAP,C 18PF-J-50V
C8143	ECUX1H560JCX	CAP,C 56PF-J-50V
C8144	ECUX1H181JCX	CAP,C 180PF-J-50V
C8145	ECUX1H150JCX	CAP,C 15PF-J-50V
C8146	ECEA1CKN100	CAP,E 10UF/16V
C8147	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C8148	ECUX1H080DCX	CAP,C 8PF-D-50V
C8149	ECUX1H080DCX	CAP,C 8PF-D-50V
C8150	ECUX1H080DCX	CAP,C 8PF-D-50V
C8151	ECUX1H100DCX	CAP,C 10PF-D-50V
C8152	ECUX1H390JCX	CAP,C 39PF-J-50V
C8153	ECUX1H100DCX	CAP,C 10PF-D-50V
C8154	ECUX1H390JCX	CAP,C 39PF-J-50V
C8155	ECUX1H330JCX	CAP,C 33PF-J-50V
C8156	ECUX1H181JCX	CAP,C 180PF-J-50V
		DIODES
D004	MA4330H	DIODE
D005	MA4056M	DIODE
D006	MA4051L	DIODE, ZENER
D007	MA4051L	DIODE, ZENER
D008	MA4056M	DIODE
D020	MA4056	DIODE, ZENER
D021	MA4056	DIODE, ZENER
D095	MTZJT-7739D	DIODE, ZENER
D352	ERA15-04	DIODE
D353	ERA15-04	DIODE
D354	ERA15-04	DIODE
D355	ERA15-04	DIODE
D356	ERA15-04	DIODE
D357	ERA15-04	DIODE
D365	MA4130M	DIODE
D366	MA4130M	DIODE
D367	MA4130M	DIODE
D401	MA4056H	DIODE, ZENER
D408	MA4062M	DIODE, ZENER
D409	MA4062M	DIODE, ZENER
D412	MA700A	DIODE
D451	MA165	DIODE
D455	ERA15-01	DIODE
D491	MA165	DIODE
D492	MA165	DIODE
D500	MA165	DIODE
D501	MA165	DIODE
D503	EU02V0	DIODE
D504	EU02V0	DIODE
D505	**MA4062L**	**DIODE**
D506	MA700A	DIODE
D507	MA4039M	DIODE, ZENER
D508	MA700A	DIODE
D509	MA165	DIODE
D510	MA4082M	DIODE

REF NO.	PART NO.	DESCRIPTION
D525	**EG01V0**	**DIODE**
D526	**EG01C**	**DIODE**
D529	MA165	DIODE
D530	**MA4082M**	**DIODE**
D531	**ERA22-04**	**DIODE, ZENER**
D551	**EU02V0**	**DIODE**
D553	MA4390M	DIODE
D554	**AU02**	**DIODE**
D555	**AU02**	**DIODE**
D556	MA165	DIODE
D561	AU02	DIODE
D563	**RH3GLF102**	**DIODE**
D571	FMV-3GULF730	DIODE
D715	AU02	DIODE
D723	MA29-A	DIODE
D724	MA29-A	DIODE
D725	MA4056M	DIODE
D730	MA165	DIODE
D732	AU02	DIODE
D801	**D6SB80**	**DIODE**
D802	MA700A	DIODE
D803	AU02	DIODE
D804	MA165	DIODE
D805	AU01Z	DIODE
D807	MA165	DIODE
D818	MA4150M	DIODE
D839	**TMPG10G3**	**DIODE**
D841	**EU02V0**	**DIODE**
D843	D4L20UAF4012	DIODE
D844	**RL3ZLFS1**	**DIODE**
D845	**TVSRU4AM**	**DIODE**
D847	MA165	DIODE
D848	MA4033M	DIODE, ZENER
D850	MA4100M	DIODE, ZENER
D852	MA167	DIODE
D860	AU02	DIODE
D861	TVSA81004	DIODE
D862	TVSA81004	DIODE
D871	MA165	DIODE
D951	AU02	DIODE
D952	AU02	DIODE
D953	TVSSR2KL	DIODE, PROTECTION
D954	AU02	DIODE
D955	AU02	DIODE
D958	MA170	DIODE
D961	MA165	DIODE
D1501	MA165	DIODE
D1502	MA165	DIODE
D1503	MA165	DIODE
D1591	MA165	DIODE
D1701	MA4056M	DIODE

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
D1703	MA4100M	DIODE, ZENER
D1705	MA29W-ATA	DIODE
D1706	AU02	DIODE
D1714	TMPG10G3	DIODE
D1715	MA1100L	DIODE
D1717	MA165	DIODE
D2102	MA4330H	DIODE
D2302	MA165	DIODE
D2303	MA165	DIODE
D2360	MA165	DIODE
D2419	MA165	DIODE
D2460	MA165	DIODE
D2601	MA151A	DIODE
D2602	MA151A	DIODE
D2606	MA151WK	DIODE
D2607	MA3047H	DIODE
D2817	MA4047M	DIODE, ZENER
D2822	MA165	DIODE
D2850	**FMGG26S**	**DIODE**
D3042	MA3110	DIODE
D3043	MA3110	DIODE
D3051	MA3110	DIODE
D3053	MA3110	DIODE
D3191	MA4110M	DIODE, ZENER
D3192	MA4110M	DIODE, ZENER
D3193	MA4110M	DIODE, ZENER
D3451	MA4110M	DIODE, ZENER
D3452	MA4110M	DIODE, ZENER
D3453	MA4110M	DIODE, ZENER
D3456	MA4110M	DIODE, ZENER
D3457	MA4110M	DIODE, ZENER
D3458	MA4110M	DIODE, ZENER
D3810	TAP102BM03	POSISTER
D3835	MA165	DIODE
D4301	MA3036H	DIODE
D6501	1SS355TE-17	DIODE
D6502	1SS355TE-17	DIODE
	FUSES	
F804	ERDS2TC0	RESISTOR, 1/4 WATT JUMPER
F3801	**XBA1C63NU100**	**FUSE 6.3A/125V**
	INTEGRATED CIRCUITS	
IC001	MN102L35GTH1	INT CKT
IC002	24LC08BIP	INT CKT
IC005	PQ05RD1B	INT CKT
IC006	MN1280R	INT CKT
IC101	AN5170K	INT CKT
IC301	AN5308NK	INT CKT
IC351	TDA6111Q	INT CKT
IC352	TDA6111Q	INT CKT
IC353	TDA6111Q	INT CKT
IC411	**AN5491K**	**INT CKT**

REF NO.	PART NO.	DESCRIPTION
IC451	LA7845N	INT CKT
IC481	BA15218F-E2	INT CKT
IC482	TC74HC107AFL	INT CKT
IC491	AN6562	INT CKT
IC506	UPC1093J-T	INT CKT
IC601	M52055FP-E2	INT CKT
IC701	AN6914S-E1	INT CKT
IC702	BA15218F-E2	INT CKT
IC703	CXA1875AM-T4	INT CKT
IC801	**AN8029**	**INT CKT**
IC802	**SE140N**	**ERROR AMPLIFIER**
IC803	SI-3120CA	INT CKT
IC811	**0N3131R**	**INT CKT**
IC881	SI-3090CA	INT CKT
IC882	SI-3090CA	INT CKT
IC883	SI-3050CA	INT CKT
IC884	SI-3050CA	INT CKT
IC885	PQ3RD13B	INT CKT
IC1501	BA15218F-E2	INT CKT
IC1502	BA15218F-E2	INT CKT
IC1551	TC4053BFEL	INT CKT
IC1552	TC4053BFEL	INT CKT
IC1553	M52036SP	INT CKT
IC1571	TC74HC4538AF	INT CKT
IC1701	TVSA1093	INT CKT
IC1702	BA15218N	INT CKT
IC1801	M65617SP	PIP CONTROLLER
IC2101	AN5170K	INT CKT
IC2201	AN5819K	INT CKT
IC2301	AN5275	INT CKT
IC2302	AN78L05	INT CKT
IC2331	BA15218N	INT CKT
IC2351	AN7396K	INT CKT
IC2401	AN5275	INT CKT
IC2452	NJM2902MTE1	INT CKT
IC2601	AN5392FBQ	INT CKT
IC2602	AN5395FBP	INT CKT
IC2603	M52055FP-E2	INT CKT
IC2604	CXA1875AM-T4	INT CKT
IC3001	CXA2079Q	INT CKT
IC3191	TC4066BP	INT CKT
IC3808	TVSS1WBS20	DIODE, BRIDGE RECTIFIER
IC3809	TVSS1WBS20	DIODE, BRIDGE RECTIFIER
IC6501	MN8283	INT CKT
IC6502	TVSA0274	INT CKT
IC6504	PST9128NR	INT CKT
IC6505	PQ3RD13B	INT CKT
IC8001	MB87F1720	INT CKT
IC8002	TLC2932IPWL	INT CKT
IC8003	TC7WH74FUEL	INT CKT
IC8004	D77538PGE	INT CKT

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

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REF NO.	PART NO.	DESCRIPTION
IC8005	F432171PJ	INT CKT
IC8006	MN47V78ST1	INT CKT
IC8007	MN47V78ST1	INT CKT
IC8008	MN47V76ST1	INT CKT
IC8011	AN77L035M-E1	INT CKT
IC8012	AN77L035M-E1	INT CKT
IC8013	SN74F04NSL	INT CKT
IC8016	TC74LCX244FL	INT CKT
		COILS
JS4	EXCELDR25	FERRITE BEAD
LC2607	ERD25TC0T	JUMPER
LC6501	TAX10075	FILTER
LC6502	TAX10073	FILTER
LC6503	TAX10073	FILTER
LC6504	TAX10075	FILTER
LC6505	TAX10073	FILTER
LC6506	TAX10073	FILTER
LC6507	TAX10073	FILTER
LC6508	TAX10073	FILTER
LC6509	TAX10073	FILTER
LC6512	TAX10073	FILTER
LC8004	ERD25TC0T	JUMPER
L001	ELESN390KA	COIL, PEAKING 39UH
L004	ELESN101KA	COIL, PEAKING 100UH
L006	EXCELSA35T	FERRITE BEAD
L007	EXCELSA35T	FERRITE BEAD
L008	EXCELDR25C	FERRITE BEAD
L010	EXCELSA35	FERRITE BEAD
L011	EXCELSA35T	FERRITE BEAD
L012	TLUABTA100K	COIL, PEAKING 10UH
L013	TLUABTA100K	COIL, PEAKING 10UH
L014	EXCELSA35T	FERRITE BEAD
L015	TLUABTA100K	COIL, PEAKING 10UH
L016	TLUABTA100K	COIL, PEAKING 10UH
L017	EXCELSA35	FERRITE BEAD
L018	EXCELSA35	FERRITE BEAD
L019	EXCELSA35T	FERRITE BEAD
L025	EXCELSA35T	FERRITE BEAD
L088	TLUABTA470K	COIL, PEAKING 47UH
L103	ELESN150JA	COIL, PEAKING 15UH
L105	EIV7EN053B	COIL, VCO
L118	ELESN150JA	COIL, PEAKING 15UH
L135	ELESN560JA	COIL, PEAKING 56UH
L140	ELESN330JA	COIL, PEAKING 33UH
L352	ELESN8R2JA	COIL, PEAKING 8.2UH
L353	ELESN8R2JA	COIL, PEAKING 8.2UH
L354	ELESN8R2JA	COIL, PEAKING 8.2UH
L355	EXCELSA24T	FERRITE BEAD
L359	EXCELSA24T	FERRITE BEAD
L360	ELESN470JA	COIL, PEAKING 47UH
L361	EXCELSA35T	FERRITE BEAD

REF NO.	PART NO.	DESCRIPTION
L363	EXCELSA35T	FERRITE BEAD
L364	EXCELDR25	FERRITE BEAD
L400	ELESN330JA	COIL, PEAKING 33UH
L401	ELESN470JA	COIL, PEAKING 47UH
L452	ELC08D067	COIL, POWER
L455	EXCELSA35	FERRITE BEAD
L501	TLUABTA100K	COIL, PEAKING 10UH
L502	TLUABTA100K	COIL, PEAKING 10UH
L503	ELC18B151E	FILTER
L504	EXCELSA35B	FERRITE BEAD
L505	EXCELDR25	FERRITE BEAD
L506	EXCELSA35T	FERRITE BEAD
L554	EXCELSA35	FERRITE BEAD
L555	ELESN470JA	COIL, PEAKING 47UH
L556	EXCELSA35T	FERRITE BEAD
L557	EXCELSA35T	FERRITE BEAD
L561	EXCELSA35T	FERRITE BEAD
L562	EXCELSA35T	FERRITE BEAD
L567	EXCELSA35T	FERRITE BEAD
L572	**ELHKLB041B**	**COIL**
L573	**ELHKLB038B**	**COIL**
L583	EXCELSA35T	FERRITE BEAD
L584	EXCELSA35T	FERRITE BEAD
L601	ELESN820KA	COIL, PEAKING 82UH
L602	ELESN4R7KA	COIL, PEAKING 4.7UH
L711	ELESN100KA	COIL, PEAKING 10UH
L715	ELC18B272L	FILTER
L721	EXCELSA35	FERRITE BEAD
L724	TSKA064-1	FERRITE BEAD
L725	TSKA064-1	FERRITE BEAD
L772	ELESN470JA	COIL, PEAKING 47UH
L781	EXCELDR25	FERRITE BEAD
L783	EXCELDR25	FERRITE BEAD
L784	EXCELDR25	FERRITE BEAD
L803	EXCELSA35	FERRITE BEAD
L804	EXCELSA35	FERRITE BEAD
L805	EXCELSA35	FERRITE BEAD
L806	EXCELSA35	FERRITE BEAD
L807	TSKA064-1	FERRITE BEAD
L808	EXCELSA39E	FERRITE BEAD
L809	EXCELSA39E	FERRITE BEAD
L810	EXCELDR35	FERRITE BEAD
L812	EXCELSA35	FERRITE BEAD
L814	EXCELSA35	FERRITE BEAD
L841	TALL08T220KA	TRANSFORMER, LINE FILTER
L842	TSKA064-1	FERRITE BEAD
L849	TALL08T220KA	TRANSFORMER, LINE FILTER
L851	EXCELSA39E	FERRITE BEAD
L854	TALL08T220KA	TRANSFORMER, LINE FILTER
L889	EXCELSA35T	FERRITE BEAD
L903	ELESN560KA	COIL, PEAKING 56UH

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

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REF NO.	PART NO.	DESCRIPTION
L953	EXCELSA35	FERRITE BEAD
L954	EXCELSA35	FERRITE BEAD
L956	EXCELSA35	FERRITE BEAD
L960	ELESNR22MA	COIL, PEAKING .22UH
L961	ELESNR22MA	COIL, PEAKING .22UH
L1551	EXCELSA35T	FERRITE BEAD
L1552	EXCELSA35T	FERRITE BEAD
L1701	ELESN100KA	COIL, PEAKING 10UH
L1801	ELESN1R5KA	COIL, PEAKING 1.5UH
L1803	ELESN2R2KA	COIL, PEAKING 2.2UH
L1804	ELESN150KA	COIL, PEAKING 15UH
L1806	ELESN1R0KA	COIL, PEAKING 1.0UH
L1807	ELESN1R0KA	COIL, PEAKING 1.0UH
L1808	EXCELDR25	FERRITE BEAD
L2102	ELESN100KA	COIL, PEAKING 10UH
L2103	ELESN150JA	COIL, PEAKING 15UH
L2104	ELESN330JA	COIL, PEAKING 33UH
L2105	ELESN1R2KA	COIL, PEAKING 1.2UH
L2106	ELESN560JA	COIL, PEAKING 56UH
L2107	ELESN1R2KA	COIL, PEAKING 1.2UH
L2109	EIV7EN053B	COIL, VCO
L2201	ELESN102JA	COIL, PEAKING 1000UH
L2202	ELESN471JA	COIL, PEAKING 470UH
L2301	EXCELSA35T	FERRITE BEAD
L2302	EXCELSA35	FERRITE BEAD
L2303	EXCELSA35T	FERRITE BEAD
L2304	EXCELSA35T	FERRITE BEAD
L2305	EXCELSA35T	FERRITE BEAD
L2402	EXCELSA35	FERRITE BEAD
L2601	EXCELDR25	FERRITE BEAD
L2603	TSK1040	FERRITE BEAD
L2604	ELB4K149B	FILTER, LOW PASS
L2605	ELESN2R7KA	COIL
L2606	EXCELDR25	FERRITE BEAD
L2608	ELESN820JA	COIL, PEAKING 82UH
L2609	ELESN100JA	COIL, PEAKING 10UH
L2851	TSKA064-1	FERRITE BEAD
L2852	TSKA064-1	FERRITE BEAD
L3801	**ELF18D850C**	**LINE FILTER**
L3802	**ELF18D850C**	**LINE FILTER**
L4301	ELESN2R2KA	COIL, PEAKING 2.2UH
L6501	ELESN4R7JA	COIL, PEAKING 4.7UH
L6502	ELESN100JA	COIL, PEAKING 10UH
L6503	ELESN330JA	COIL, PEAKING 33UH
L6505	ELESN220JA	COIL, PEAKING 22UH
L6507	ELESN120JA	COIL, PEAKING 12UH
L6508	ELESN2R2KA	COIL, PEAKING 2.2UH
L6510	ELESN2R2KA	COIL, PEAKING 2.2UH
L6511	ELESN150JA	COIL, PEAKING 15UH
L8002	ELESN100JA	COIL, PEAKING 10UH
L8003	ELESN100JA	COIL, PEAKING 10UH
L8004	ELESN100JA	COIL, PEAKING 10UH
L8005	ELESN100JA	COIL, PEAKING 10UH
L8006	ELESN100JA	COIL, PEAKING 10UH
L8007	ELESN100JA	COIL, PEAKING 10UH
L8008	ELESN2R2JA	RADIAL INDUCTOR 2.2UH
L8009	ELESN4R7JA	COIL, PEAKING 4.7UH
L8010	ELESN220JA	COIL, PEAKING 22UH
L8011	ELESN2R2JA	RADIAL INDUCTOR 2.2UH
L8012	ELESN4R7JA	COIL, PEAKING 4.7UH
L8013	ELESN220JA	COIL, PEAKING 22UH
L8014	ELESN2R2JA	RADIAL INDUCTOR 2.2UH
L8015	ELESN4R7JA	COIL, PEAKING 4.7UH
L8016	ELESN220JA	COIL, PEAKING 22UH
L8017	ELESN1R8KA	RADIAL INDUCTOR 1.8UH
L8018	ELESN1R8KA	RADIAL INDUCTOR 1.8UH
L8019	ELESN4R7KA	COIL, PEAKING 4.7UH
L8020	ELESN100JA	COIL, PEAKING 10UH
L8021	ELESN100JA	COIL, PEAKING 10UH
L8023	EXCELDR25	FERRITE BEAD
L8024	EXCELDR25	FERRITE BEAD
		TRANSISTORS
Q014	2SD601ARTX	TRANSISTOR
Q015	2SD601ARTX	TRANSISTOR
Q016	2SD601ARTX	TRANSISTOR
Q102	2SD601ARTX	TRANSISTOR
Q140	2SD601ARTX	TRANSISTOR
Q141	2SD601ARTX	TRANSISTOR
Q142	2SB709ARTX	TRANSISTOR
Q301	2SB709ARTX	TRANSISTOR
Q306	2SD601ARTX	TRANSISTOR
Q309	2SD601ARTX	TRANSISTOR
Q310	2SD601ARTX	TRANSISTOR
Q311	2SD601ARTX	TRANSISTOR
Q401	2SD601ARTX	TRANSISTOR
Q451	2SA564AQRSTA	TRANSISTOR
Q481	2SC1685QRS	TRANSISTOR
Q482	2SC1685QRS	TRANSISTOR
Q483	2SA564AQRSTA	TRANSISTOR
Q484	2SA564AQRSTA	TRANSISTOR
Q486	2SC1685QRS	TRANSISTOR
Q491	2SC1847QRRL	TRANSISTOR
Q492	2SA886QRLB	TRANSISTOR
Q502	2SC2925STA	TRANSISTOR
Q503	2SC1685QRS	TRANSISTOR
Q504	2SC1685QRS	TRANSISTOR
Q505	2SC1685QRS	TRANSISTOR
Q552	**2SC5144LB228**	**TRANSISTOR**
Q601	2SB709ARTX	TRANSISTOR
Q604	2SD601ARTX	TRANSISTOR
Q605	2SD601ARTX	TRANSISTOR
Q606	2SD601ARTX	TRANSISTOR

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

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REF NO.	PART NO.	DESCRIPTION
Q607	2SD601ARTX	TRANSISTOR
Q608	2SD601ARTX	TRANSISTOR
Q609	2SD601ARTX	TRANSISTOR
Q610	2SD601ARTX	TRANSISTOR
Q611	2SD601ARTX	TRANSISTOR
Q612	2SD601ARTX	TRANSISTOR
Q706	2SC2925STA	TRANSISTOR
Q707	2SC1473ARTA	TRANSISTOR
Q710	2SK2538000LB	TRANSISTOR
Q801	**2SK1938RF101**	**TRANSISTOR**
Q806	2SC1685QRS	TRANSISTOR
Q807	2SC1685QRS	TRANSISTOR
Q808	2SA564AQRSTA	TRANSISTOR
Q850	2SC1685QRS	TRANSISTOR
Q851	2SC1685QRS	TRANSISTOR
Q860	2SB1011QRL	TRANSISTOR
Q861	2SA564AQRSTA	TRANSISTOR
Q871	2SA564AQRSTA	TRANSISTOR
Q902	2SC1685QRS	TRANSISTOR
Q903	2SC1685QRS	TRANSISTOR
Q908	2SC1685QRS	TRANSISTOR
Q951	2SA720A	TRANSISTOR
Q952	2SC1318T	TRANSISTOR
Q953	2SC1318T	TRANSISTOR
Q954	2SA720A	TRANSISTOR
Q955	2SA1535QRLB	TRANSISTOR
Q956	2SC3944QLB	TRANSISTOR
Q1401	2SD601ARTX	TRANSISTOR
Q1501	2SC3941RTA	TRANSISTOR
Q1502	2SC1685QRS	TRANSISTOR
Q1552	2SD601ARTX	TRANSISTOR
Q1554	2SD601ARTX	TRANSISTOR
Q1555	2SD601ARTX	TRANSISTOR
Q1560	2SD601ARTX	TRANSISTOR
Q1561	UN2213	TRANSISTOR
Q1571	2SD601ARTX	TRANSISTOR
Q1701	2SC4572RB	TRANSISTOR
Q1703	2SA1837LBMAT	TRANSISTOR
Q1704	2SC3870LB	TRANSISTOR
Q1705	2SA564AQRSTA	TRANSISTOR
Q1706	2SC3870LB	TRANSISTOR
Q1707	2SC1685QRS	TRANSISTOR
Q1708	2SC1685QRS	TRANSISTOR
Q1710	2SC1685QRS	TRANSISTOR
Q1711	2SC1685QRS	TRANSISTOR
Q1801	2SD601ARTX	TRANSISTOR
Q1802	2SD601ARTX	TRANSISTOR
Q1803	2SD601ARTX	TRANSISTOR
Q1804	2SB709ARTX	TRANSISTOR
Q1805	2SB709ARTX	TRANSISTOR
Q2101	2SD601ARTX	TRANSISTOR

REF NO.	PART NO.	DESCRIPTION
Q2301	2SB709ARTX	TRANSISTOR
Q2302	2SD601ARTX	TRANSISTOR
Q2331	2SD601ARTX	TRANSISTOR
Q2332	2SB709ARTX	TRANSISTOR
Q2333	2SD601ARTX	TRANSISTOR
Q2334	2SD601ARTX	TRANSISTOR
Q2335	2SB709ARTX	TRANSISTOR
Q2406	2SA564AQRSTA	TRANSISTOR
Q2407	2SC1685QRS	TRANSISTOR
Q2601	2SD601ARTX	TRANSISTOR
Q2602	2SD601ARTX	TRANSISTOR
Q2603	2SD601ARTX	TRANSISTOR
Q2604	2SD601ARTX	TRANSISTOR
Q2605	2SD601ARTX	TRANSISTOR
Q2606	2SD601ARTX	TRANSISTOR
Q2607	2SC2480TX	TRANSISTOR
Q2608	2SD601ARTX	TRANSISTOR
Q2609	2SB709ARTX	TRANSISTOR
Q2610	2SD601ARTX	TRANSISTOR
Q2611	2SD601ARTX	TRANSISTOR
Q2612	2SB709ARTX	TRANSISTOR
Q2614	2SB709ARTX	TRANSISTOR
Q2616	2SB709ARTX	TRANSISTOR
Q2618	2SD601ARTX	TRANSISTOR
Q2619	2SB709ARTX	TRANSISTOR
Q3031	2SB709ARTX	TRANSISTOR
Q3032	2SD601ARTX	TRANSISTOR
Q3033	2SD601ARTX	TRANSISTOR
Q3051	2SD601ARTX	TRANSISTOR
Q3052	2SD601ARTX	TRANSISTOR
Q3053	2SB709ARTX	TRANSISTOR
Q3101	2SD601ARTX	TRANSISTOR
Q3102	2SC2480TX	TRANSISTOR
Q3103	2SD601ARTX	TRANSISTOR
Q3104	2SD601ARTX	TRANSISTOR
Q3105	2SC2480TX	TRANSISTOR
Q3106	2SD601ARTX	TRANSISTOR
Q3107	2SD601ARTX	TRANSISTOR
Q3108	2SC2480TX	TRANSISTOR
Q3109	2SD601ARTX	TRANSISTOR
Q3191	2SD601ARTX	TRANSISTOR
Q3192	2SD601ARTX	TRANSISTOR
Q3818	2SC1685QRS	TRANSISTOR
Q4309	2SB709ARTX	TRANSISTOR
Q4310	2SD601ARTX	TRANSISTOR
Q4311	2SB709ARTX	TRANSISTOR
Q4312	2SD601ARTX	TRANSISTOR
Q4313	2SD601ARTX	TRANSISTOR
Q4315	2SC1384Q	TRANSISTOR
Q6501	2SD601ARTX	TRANSISTOR
Q6502	2SD601ARTX	TRANSISTOR

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
Q6503	2SB709ARTX	TRANSISTOR
Q6504	2SD601ARTX	TRANSISTOR
Q6505	2SD601ARTX	TRANSISTOR
Q6506	2SD601ARTX	TRANSISTOR
Q6507	2SD601ARTX	TRANSISTOR
Q6508	2SD601ARTX	TRANSISTOR
Q6509	2SB709ARTX	TRANSISTOR
Q6510	2SD601ARTX	TRANSISTOR
Q6511	2SB709ARTX	TRANSISTOR
Q6512	2SD601ARTX	TRANSISTOR
Q6514	2SD601ARTX	TRANSISTOR
Q6515	2SB709ARTX	TRANSISTOR
Q6517	2SD601ARTX	TRANSISTOR
Q6518	2SD601ARTX	TRANSISTOR
Q8001	2SD601ARTX	TRANSISTOR
Q8002	2SD601ARTX	TRANSISTOR
Q8003	2SD601ARTX	TRANSISTOR
Q8004	2SD601ARTX	TRANSISTOR
Q8005	2SD601ARTX	TRANSISTOR
Q8006	2SD601ARTX	TRANSISTOR
Q8007	2SD601ARTX	TRANSISTOR
Q8008	2SD601ARTX	TRANSISTOR
Q8009	2SD601ARTX	TRANSISTOR
Q8010	2SB709ARTX	TRANSISTOR
Q8011	2SB709ARTX	TRANSISTOR
Q8012	2SB709ARTX	TRANSISTOR
		RELAYS
RL002	**TSE10814**	**RELAY**
RL801	**TSEH8007**	**RELAY**
RL804	**TSEH0005**	**RELAY**
		RESISTORS
R001	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R002	ERJ6GEYJ102	RES,M 1K-J-1/10
R003	ERJ6GEYJ102	RES,M 1K-J-1/10
R008	ERJ6GEYJ102	RES,M 1K-J-1/10
R011	ERJ6GEYJ103	RES,M 10K-J-1/10
R013	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R014	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R015	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R016	ERJ6GEYJ103	RES,M 10K-J-1/10
R017	ERJ6GEYJ103	RES,M 10K-J-1/10
R018	ERJ6GEYJ103	RES,M 10K-J-1/10
R019	ERJ6GEYJ103	RES,M 10K-J-1/10
R020	ERJ6GEYJ471	RES,M 470-J-1/10
R021	ERDS2TJ562	RES,C 5.6K-J-1/4
R022	ERJ6GEYJ102	RES,M 1K-J-1/10
R026	ERJ6GEYJ101	RES,M 100-J-1/10
R028	ERDS2TJ102	RES,C 1K-J-1/4
R029	ERJ6GEYJ102	RES,M 1K-J-1/10
R031	ERJ6GEYJ220	RES,M 22-J-1/10
R032	ERJ6ENF1601	RES,M 1.6K-F-1/10W

REF NO.	PART NO.	DESCRIPTION
R033	ERJ6ENF6800	RES,M 680-F-1/10
R036	ERJ6GEYJ103	RES,M 10K-J-1/10
R037	ERJ6GEYJ471	RES,M 470-J-1/10
R038	ERJ6GEYJ331	RES,M 330-J-1/10
R040	ERJ6ENF1200	RES,M 120-F-1/10W
R041	ERJ6ENF1201	RES,M 1.2K-F-1/10
R043	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R044	ERJ6GEYJ151	RES,M 150-J-1/10
R047	ERJ6GEYJ102	RES,M 1K-J-1/10
R048	ERJ6GEYJ102	RES,M 1K-J-1/10
R051	ERJ6GEYJ471	RES,M 470-J-1/10
R052	ERDS2TJ101	RES,C 100-J-1/4
R053	ERDS2TJ101	RES,C 100-J-1/4
R054	ERJ6GEYJ103	RES,M 10K-J-1/10
R055	ERJ6GEYJ471	RES,M 470-J-1/10
R056	ERDS2TJ272	RES,C 2.7K-J-1/4
R057	ERDS2TJ272	RES,C 2.7K-J-1/4
R058	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R059	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R060	ERJ6GEYJ102	RES,M 1K-J-1/10
R061	ERJ6GEYJ102	RES,M 1K-J-1/10
R062	ERJ6GEYJ101	RES,M 100-J-1/10
R064	ERJ6ENF1200	RES,M 120-F-1/10W
R066	ERJ6ENF1200	RES,M 120-F-1/10W
R068	ERDS2TJ103	RES,C 10K-J-1/4
R080	ERJ6GEYJ101	RES,M 100-J-1/10
R081	ERJ6GEYJ103	RES,M 10K-J-1/10
R082	ERJ6GEYJ471	RES,M 470-J-1/10
R083	ERJ6GEYJ331	RES,M 330-J-1/10
R084	ERDS2TJ912	RES,C 9.1K-J-1/4
R085	ERDS2TJ223	RES,C 22K-J-1/4
R086	ERDS2TJ470	RES,C 47-J-1/4
R087	ERDS2TJ222	RES,C 2.2K-J-1/4
R088	ERDS2TJ222	RES,C 2.2K-J-1/4
R089	ERDS2TJ332	RES,C 3.3K-J-1/4
R090	ERDS2TJ512	RES,C 5.1K-J-1/4
R091	ER0S2CKF1202	RES,M 12K-F-1/4
R092	ER0S2CKF1002	RES,M 10K-F-1/4
R093	ER0S2CKF1582	RES,M 15.8K-F-1/4W
R102	ERJ6GEYJ102	RES,M 1K-J-1/10
R103	ERJ6GEYJ102	RES,M 1K-J-1/10
R112	ERJ6GEYJ102	RES,M 1K-J-1/10
R113	ERJ6GEYJ221	RES,M 220-J-1/10
R114	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R115	EVND2AA03B33	CONTROL 3K
R117	ERJ6GEYJ101	RES,M 100-J-1/10
R118	ERJ6GEYJ331	RES,M 330-J-1/10
R119	ERJ6GEYJ152	RES,M 1.5K-J-1/10
R121	ERJ6GEYJ121	RES,M 120-J-1/10
R125	ERJ6GEYJ331	RES,M 330-J-1/10
R126	ERJ6GEYJ183	RES,M 18K-J-1/10

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R128	ERJ6GEYJ683	RES,M 68K-J-1/10
R129	ERJ6GEYJ103	RES,M 10K-J-1/10
R135	ERJ6GEYJ331	RES,M 330-J-1/10
R140	ERJ6GEYJ102	RES,M 1K-J-1/10
R141	ERJ6GEYJ471	RES,M 470-J-1/10
R142	ERJ6GEYJ102	RES,M 1K-J-1/10
R143	ERJ6GEYJ103	RES,M 10K-J-1/10
R144	ERJ6GEYJ103	RES,M 10K-J-1/10
R145	ERJ6GEYJ471	RES,M 470-J-1/10
R146	ERJ6GEYJ471	RES,M 470-J-1/10
R151	ERJ6GEYJ473	RES,M 47K-J-1/10
R152	ERJ6GEYJ473	RES,M 47K-J-1/10
R202	ERJ6GEYJ221	RES,M 220-J-1/10
R308	ERJ6GEYJ221	RES,M 220-J-1/10
R309	ERJ6GEYJ274	RES,M 270K-J-1/10
R310	ERJ6GEYJ102	RES,M 1K-J-1/10
R313	ERJ6GEYJ561	RES,M 560-J-1/10
R315	ERJ6GEYJ103	RES,M 10K-J-1/10
R316	ERJ6GEYJ471	RES,M 470-J-1/10
R317	ERJ6GEYJ273	RES,M 27K-J-1/10
R318	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R319	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R321	ERJ6GEYJ471	RES,M 470-J-1/10
R322	ERJ6GEYJ102	RES,M 1K-J-1/10
R323	ERJ6GEYJ102	RES,M 1K-J-1/10
R332	ERDS2TJ222	RES,C 2.2K-J-1/4
R334	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R335	ERJ6GEYJ564	RES,M 560K-J-1/10
R336	ERJ6GEYJ684	RES,M 680K-J-1/10
R337	ERJ6GEYJ333	RES,M 33K-J-1/10
R348	ERJ6ENF5600	RES,M 560-F-1/10W
R349	ERJ6ENF6800	RES,M 680-F-1/10
R356	ERF3AK2R7	RES,W 2.7-K-3W
R361	ERDS2TJ103	RES,C 10K-J-1/4
R363	ERDS2TJ561	RES,C 560-J-1/4
R364	ERG3FJ473H	RES,M 47K-J-3W
R365	ER0S2CKF8200	RES,M 820-F-1/4W
R366	ERDS2TJ680	RES,C 68-J-1/4
R368	ERC12GK561	RES,S 560-J-1/2
R369	ERC12GK561	RES,S 560-J-1/2
R370	ERDS2TJ103	RES,C 10K-J-1/4
R372	ERDS2TJ561	RES,C 560-J-1/4
R373	ERG3FJ473H	RES,M 47K-J-3W
R374	ERC12GK561	RES,S 560-J-1/2
R376	ER0S2CKF1001	RES,M 1K-F-1/4
R377	ERDS2TJ331	RES,C 330-J-1/4
R378	ERDS2TJ333	RES,C 33K-J-1/4
R379	ERDS2TJ822	RES,C 8.2K-J-1/4
R380	ERDS2TJ103	RES,C 10K-J-1/4
R383	ERDS2TJ561	RES,C 560-J-1/4
R384	ERG3FJ473H	RES,M 47K-J-3W

REF NO.	PART NO.	DESCRIPTION
R385	ER0S2CKF8200	RES,M 820-F-1/4W
R386	ERDS2TJ151	RES,C 150-J-1/4
R392	ERDS1TJ561	RES,C 560-J-1/2
R395	ERDS1TJ394	RES,C 390K-J-1/2
R401	ERJ6GEYJ102	RES,M 1K-J-1/10
R407	ERDS2TJ560	RES,C 56-J-1/4
R409	ERDS2TJ560	RES,C 56-J-1/4
R412	ERDS2TJ683	RES,C 68K-J-1/4
R413	ERDS2TJ223	RES,C 22K-J-1/4
R414	ERDS2TJ221	RES,C 220-J-1/4
R415	ER0S2CKF1002	RES,M 10K-F-1/4
R422	ER0S2CKF2202	RES,M 22K-F-1/4
R423	ER0S2CKF1202	RES,M 12K-F-1/4
R434	ER0S2CKF1471	RES,M 1.47K-F-1/4
R436	ER0S2CKF1582	RES,M 15.8K-F-1/4W
R437	ERDS2TJ821	RES,C 820-J-1/4
R440	ERDS2TJ124	RES,C 120K-J-1/4
R443	ERDS2TJ101	RES,C 100-J-1/4
R451	ERDS2TJ472	RES,C 4.7K-J-1/4
R452	ERDS1FJ1R2	RES,C 1.2-J-1/2
R453	ERDS2TJ123	RES,C 12K-J-1/4
R454	ERDS2TJ473	RES,C 47K-J-1/4
R455	ERDS2TJ103	RES,C 10K-J-1/4
R456	ERG1SJ151P	RES,M 150-J-1W
R457	ERDS1FJ1R5	RES,C 1.5-J-1/2
R458	ERDS1FJ1R2	RES,C 1.2-J-1/2
R460	ERDS2TJ103	RES,C 10K-J-1/4
R461	ERDS2TJ223	RES,C 22K-J-1/4
R462	ERDS2TJ682	RES,C 6.8K-J-1/4
R463	ERDS2TJ1R2	RES,C 1.2-J-1/4W
R464	ERDS2TJ103	RES,C 10K-J-1/4
R465	ERDS2TJ223	RES,C 22K-J-1/4
R466	ERDS2TJ562	RES,C 5.6K-J-1/4
R467	ERDS2TJ272	RES,C 2.7K-J-1/4
R468	ER0S2CKF4321	RES,M 4.32K-F-1/4
R469	ER0S2CKF1471	RES,M 1.47K-F-1/4
R472	ERDS2TJ102	RES,C 1K-J-1/4
R481	ERJ6GEYJ561	RES,M 560-J-1/10
R482	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R483	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R484	ERJ6GEYJ681	RES,M 680-J-1/10
R485	ERJ6GEYJ473	RES,M 47K-J-1/10
R486	ERJ6GEYJ473	RES,M 47K-J-1/10
R487	ERJ6GEYJ103	RES,M 10K-J-1/10
R488	ERJ6GEYJ473	RES,M 47K-J-1/10
R490	ERJ6GEYJ102	RES,M 1K-J-1/10
R491	ERDS2TJ272	RES,C 2.7K-J-1/4
R492	ERDS2TJ102	RES,C 1K-J-1/4
R493	ERDS1TJ3R3	RES,C 3.3-J-1/2
R494	ERDS1TJ3R3	RES,C 3.3-J-1/2
R495	ERDS1TJ332	RES,C 3.3K-J-1/2W

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R496	ERDS2TJ123	RES,C 12K-J-1/4
R497	ERG5SJ680	RES,M 68-J-5W
R501	ER0S2CKF5602	RES,M 56K-F-1/4
R502	ERDS2TJ222	RES,C 2.2K-J-1/4
R503	ER0S2CKF1002	RES,M 10K-F-1/4
R504	ERDS2TJ101	RES,C 100-J-1/4
R505	ERF5AJ330	RES,W 33-J-5W
R506	ERDS1TJ152	RES,C 1.5K-J-1/2
R507	ERDS1TJ152	RES,C 1.5K-J-1/2
R508	ERDS2TJ222	RES,C 2.2K-J-1/4
R509	EVN38CA00B53	CONTROL 5K
R510	ERDS2TJ105	RES,C 1MEG-J-1/4
R511	ERDS2TJ222	RES,C 2.2K-J-1/4
R512	ERDS2TJ103	RES,C 10K-J-1/4
R516	ERDS2TJ102	RES,C 1K-J-1/4
R517	ERDS2TJ102	RES,C 1K-J-1/4
R519	ERJ6GEYJ103	RES,M 10K-J-1/10
R532	ERDS2TJ103	RES,C 10K-J-1/4
R534	ERX3SJ1R8	RES,M 1.8-J-3W
R535	ERDS2TJ101	RES,C 100-J-1/4
R536	ER0S2CKF1202	RES,M 12K-F-1/4
R537	ERDS2TJ101	RES,C 100-J-1/4
R538	ERDS2TJ151	RES,C 150-J-1/4
R540	ER0S2CKF7501	RES,M 7.5K-F-1/4
R541	**ERDS1TJ4R7B**	**RES,C 4.7-J-1/2W**
R543	ERDS2TJ822	RES,C 8.2K-J-1/4
R544	ERDS2TJ101	RES,C 100-J-1/4
R545	ERDS2TJ682	RES,C 6.8K-J-1/4
R547	ERDS2TJ101	RES,C 100-J-1/4
R548	ERDS2TJ101	RES,C 100-J-1/4
R550	ERDS2TJ221	RES,C 220-J-1/4
R551	ERDS2TJ103	RES,C 10K-J-1/4
R552	ERDS2TJ473	RES,C 47K-J-1/4
R554	**ERX3SJR27**	**RES,M .27-J-3W**
R555	**ERDS2TJ272**	**RES,C 2.7K-J-1/4**
R556	ERF3AK3R3	RES,W 3.3-K-3W
R557	ERDS2TJ183	RES,C 18K-J-1/4
R559	**ERDS1FJ1R0**	**RES,C 1.0-J-1/2**
R560	**ERD25FJ1R0**	**RES,C 1.0-J-1/4**
R563	ERDS2TJ473	RES,C 47K-J-1/4
R564	ERDS1TJ394	RES,C 390K-J-1/2
R565	ERDS2TJ472	RES,C 4.7K-J-1/4
R566	ERDS1TJ473	RES,C 47K-J-1/2
R567	ERDS1TJ473	RES,C 47K-J-1/2
R569	ERDS1TJ120	RES,C 12-J-1/2W
R570	ERDS2TJ472	RES,C 4.7K-J-1/4
R571	ERDS2TJ222	RES,C 2.2K-J-1/4
R572	ERG5SJ471	RES,M 470-J-5W
R573	ERDS2TJ102	RES,C 1K-J-1/4
R574	ERG5SJ151	RES,M 150-J-5W
R575	ERJ6GEYJ103	RES,M 10K-J-1/10
R576	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R577	ERDS2TJ123	RES,C 12K-J-1/4
R578	ERDS2TJ472	RES,C 4.7K-J-1/4
R588	ERDS2TJ220	RES,C 22-J-1/4
R589	ERDS2TJ563	RES,C 56K-J-1/4
R594	**ERD25FJ470**	**RES,C 47-J-1/4**
R595	**ER0S2CKF1802**	**RES,M 18K-F-1/4W**
R596	**ER0S2CKF4121**	**RES,M 4.12K-F-1/4W**
R601	ERJ6GEYJ471	RES,M 470-J-1/10
R602	ERJ6GEYJ471	RES,M 470-J-1/10
R603	ERJ6GEYJ471	RES,M 470-J-1/10
R605	ERJ6GEYJ102	RES,M 1K-J-1/10
R606	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R607	ERJ6GEYJ471	RES,M 470-J-1/10
R609	ERJ6GEYJ471	RES,M 470-J-1/10
R610	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R611	ERJ6GEYJ471	RES,M 470-J-1/10
R613	ERJ6GEYJ103	RES,M 10K-J-1/10
R614	ERJ6GEYJ223	RES,M 22K-J-1/10
R615	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R617	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R618	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R619	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R626	ERJ6GEYJ333	RES,M 33K-J-1/10
R627	ERJ6GEYJ102	RES,M 1K-J-1/10
R628	ERJ6GEYJ102	RES,M 1K-J-1/10
R629	ERJ6GEYJ102	RES,M 1K-J-1/10
R630	ERJ6GEYJ471	RES,M 470-J-1/10
R631	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R632	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R633	ERJ6GEYJ102	RES,M 1K-J-1/10
R634	ERJ6GEYJ102	RES,M 1K-J-1/10
R635	ERJ6GEYJ102	RES,M 1K-J-1/10
R639	ERJ6GEYJ220	RES,M 22-J-1/10
R640	ERJ6GEYJ220	RES,M 22-J-1/10
R652	ERJ6GEYJ471	RES,M 470-J-1/10
R653	ERJ6GEYJ471	RES,M 470-J-1/10
R655	ERJ6GEYJ471	RES,M 470-J-1/10
R656	ERJ6GEYJ471	RES,M 470-J-1/10
R660	ERJ6ENF4300	RES,M 430-F-1/10W
R661	ERJ6ENF6800	RES,M 680-F-1/10
R662	ERJ6GEYJ471	RES,M 470-J-1/10
R663	ERJ6ENF5100	RES,M 510-F-1/10W
R664	ERJ6ENF6800	RES,M 680-F-1/10
R665	ERJ6GEYJ471	RES,M 470-J-1/10
R666	ERJ6GEYJ303	RES,M 30K-J-1/10
R667	ERJ6GEYJ183	RES,M 18K-J-1/10
R713	ERJ6GEYJ100	RES,M 10-J-1/10
R714	ERJ6GEYJ103	RES,M 10K-J-1/10
R715	ERJ6GEYJ223	RES,M 22K-J-1/10
R720	ERJ6GEYJ103	RES,M 10K-J-1/10

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

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REF NO.	PART NO.	DESCRIPTION
R721	ERJ6GEYJ911	RES,M 910-J-1/10
R722	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R723	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R724	ERJ6GEYJ103	RES,M 10K-J-1/10
R725	ERJ6GEYJ153	RES,M 15K-J-1/10
R726	ERJ6GEYJ153	RES,M 15K-J-1/10
R729	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R733	ERQ1CJP680	RES,F 68-J-1W
R742	ERD25FJ911	RES,C 910-J-1/4W
R743	ERG2FJ222H	RES,M 2.2K-J-2W
R746	ERJ6GEYJ272	RES,M 2.7K-J-1/10
R750	ERDS2TJ331	RES,C 330-J-1/4
R751	ERDS1TJ104	RES,C 100K-J-1/2
R752	ERDS2TJ102	RES,C 1K-J-1/4
R774	ERDS2TJ104	RES,C 100K-J-1/4
R781	ERJ6GEYJ560	RES,M 56-J-1/10
R782	ERJ6GEYJ560	RES,M 56-J-1/10
R801	ERDS2TJ103	RES,C 10K-J-1/4
R802	ERDS2TJ473	RES,C 47K-J-1/4
R803	ERDS2TJ103	RES,C 10K-J-1/4
R804	ERDS2TJ223	RES,C 22K-J-1/4
R805	**ERG2SJ223**	**RES,M 22K-J-2W**
R806	ERQ3CKR33	RES,F .33-K-3W
R807	ERDS2TJ153	RES,C 15K-J-1/4
R808	**ERF7ZK1R0**	**RES,W 1.0-K-7W**
R809	ERDS2TJ104	RES,C 100K-J-1/4
R810	**ERX12SJR22**	**RES,M .22-J-1/2**
R811	**ERX12SJR22**	**RES,M .22-J-1/2**
R812	**ERX12SJR22**	**RES,M .22-J-1/2**
R813	ERDS1FJ102	RES,C 1K-J-1/2
R814	ERD25FJ101	RES,C 100-J-1/4
R815	ERDS2TJ331	RES,C 330-J-1/4
R816	ERDS2TJ471	RES,C 470-J-1/4
R817	ER0S2CKF1371	RES,M 1370-F-1/4W
R818	ERDS2TJ220	RES,C 22-J-1/4
R819	**ERQ3CKR33**	**RES,F .33-K-3W**
R820	**ERDS1FJ1R0**	**RES,C 1.0-J-1/2**
R821	**ERDS1FJ1R0**	**RES,C 1.0-J-1/2**
R822	ERDS1FJ183	RES,C 18K-J-1/2W
R824	**ERC12ZGK825**	**RES,S 8.2MEG-K-1/2**
R825	**ERQ1CZKR22**	**RES,F .22-K-1W**
R826	**ERC12ZGM825**	**RES,S 8.2MEG-M-1/2**
R837	ERDS2TJ103	RES,C 10K-J-1/4
R838	ERDS2TJ101	RES,C 100-J-1/4
R839	ERDS2TJ100	RES,C 10-J-1/4
R840	**ERQ12HKR22**	**RES,F .22-K-1/2**
R841	ERDS2TJ102	RES,C 1K-J-1/4
R842	ERDS1FJ470	RES,C 47-J-1/2
R843	ERDS2TJ102	RES,C 1K-J-1/4
R844	ERDS1FJ470	RES,C 47-J-1/2
R845	ERDS2TJ104	RES,C 100K-J-1/4

REF NO.	PART NO.	DESCRIPTION
R846	ERDS2TJ223	RES,C 22K-J-1/4
R848	ERDS2TJ332	RES,C 3.3K-J-1/4
R850	ERDS2TJ332	RES,C 3.3K-J-1/4
R851	ERDS1TJ222	RES,C 2.2K-J-1/2
R852	ERDS2TJ102	RES,C 1K-J-1/4
R854	ERDS2TJ103	RES,C 10K-J-1/4
R858	ERDS2TJ473	RES,C 47K-J-1/4
R859	ERDS2TJ472	RES,C 4.7K-J-1/4
R861	ERDS2TJ223	RES,C 22K-J-1/4
R862	ERDS2TJ103	RES,C 10K-J-1/4
R863	ERDS2TJ103	RES,C 10K-J-1/4
R864	ERDS2TJ101	RES,C 100-J-1/4
R865	ERDS2TJ101	RES,C 100-J-1/4
R866	ERG1SJ101P	RES,M 100-J-1W
R867	ERDS2TJ472	RES,C 4.7K-J-1/4
R868	**ERX3SJ1R0**	**RES,M 1.0-J-3W**
R869	ERG1SJ101P	RES,M 100-J-1W
R871	ERDS1FJ1R2	RES,C 1.2-J-1/2
R872	ERDS2TJ103	RES,C 10K-J-1/4
R873	ERDS2TJ223	RES,C 22K-J-1/4
R874	ERDS2TJ103	RES,C 10K-J-1/4
R875	ERDS2TJ103	RES,C 10K-J-1/4
R879	ERG2FJ100H	RES,M 10K-J-1/2W
R882	ERG2FJ820H	RES,M 82-J-2W
R901	ERDS1FJ102	RES,C 1K-J-1/2
R902	ERDS2TJ563	RES,C 56K-J-1/4
R903	ERDS2TJ183	RES,C 18K-J-1/4
R904	ERDS2TJ822	RES,C 8.2K-J-1/4
R905	ERDS2TJ822	RES,C 8.2K-J-1/4
R907	ERDS2TJ151	RES,C 150-J-1/4
R908	ERDS2TJ102	RES,C 1K-J-1/4
R917	ERDS2TJ101	RES,C 100-J-1/4
R919	ERQ14AJ120	RES,F 12-J-1/4W
R920	ERQ14AJ120	RES,F 12-J-1/4W
R930	ERDS2TJ101	RES,C 100-J-1/4
R951	ERDS2TJ271	RES,C 270-J-1/4
R952	ERDS2TJ561	RES,C 560-J-1/4
R954	ERDS1FJ561	RES,C 560-J-1/2
R956	ERDS1FJ561	RES,C 560-J-1/2
R960	ERQ14AJ100	RES,F 10-J-1/4
R964	ERDS2TJ222	RES,C 2.2K-J-1/4
R965	ERDS2TJ683	RES,C 68K-J-1/4
R966	ERG3FJ471H	RES,M 470-J-3W
R967	ERDS2TJ683	RES,C 68K-J-1/4
R968	ERDS2TJ222	RES,C 2.2K-J-1/4
R969	ERDS1FJ390	RES,C 39-J-1/2
R970	ERDS2TJ2R7	RES,C 2.7-J-1/4
R971	ERDS2TJ2R7	RES,C 2.7-J-1/4
R972	ERDS1FJ390	RES,C 39-J-1/2
R1401	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R1402	ERJ6GEYJ102	RES,M 1K-J-1/10

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R1403	ERJ6GEYJ471	RES,M 470-J-1/10
R1408	ERJ6GEYJ333	RES,M 33K-J-1/10
R1501	ERJ6GEYJ102	RES,M 1K-J-1/10
R1502	ERJ6GEYJ103	RES,M 10K-J-1/10
R1504	ERDS2TJ334	RES,C 330K-J-1/4
R1505	ERJ6GEYJ153	RES,M 15K-J-1/10
R1506	ERJ6GEYJ102	RES,M 1K-J-1/10
R1510	ERC12GK101	RES,S 100-K-1/2
R1511	ERDS2TJ184	RES,C 180K-J-1/4
R1512	EVN38CA00B15	CONTROL 100K
R1513	ERDS2TJ273	RES,C 27K-J-1/4
R1514	ERJ6GEYJ101	RES,M 100-J-1/10
R1515	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R1516	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R1517	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R1518	ERJ6GEYJ103	RES,M 10K-J-1/10
R1519	ERJ6GEYJ822	RES,M 8.2K-J-1/10
R1520	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R1522	ERJ6GEYJ563	RES,M 56K-J-1/10
R1523	ERJ6GEYJ393	RES,M 39K-J-1/10
R1524	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R1525	ERJ6GEYJ393	RES,M 39K-J-1/10
R1526	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R1529	ERJ6GEYJ563	RES,M 56K-J-1/10
R1551	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R1554	ERJ6GEYJ102	RES,M 1K-J-1/10
R1556	ERJ6GEYJ473	RES,M 47K-J-1/10
R1557	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R1558	ERJ6GEYJ103	RES,M 10K-J-1/10
R1559	ERJ6GEYJ684	RES,M 680K-J-1/10
R1560	ERJ6GEYJ104	RES,M 100K-J-1/10
R1561	ERJ6GEYJ393	RES,M 39K-J-1/10
R1562	ERJ6GEYJ513	RES,M 51K-J-1/10
R1563	ERJ6GEYJ303	RES,M 30K-J-1/10
R1564	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R1568	ERJ6GEYJ102	RES,M 1K-J-1/10
R1569	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R1570	ERDS2TJ151	RES,C 150-J-1/4
R1571	ERJ6GEYJ163	RES,M 16K-J-1/10W
R1572	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R1573	ERJ6GEYJ102	RES,M 1K-J-1/10
R1574	ERJ6GEYJ471	RES,M 470-J-1/10
R1576	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R1577	ERJ6GEYJ103	RES,M 10K-J-1/10
R1578	ERJ6GEYJ471	RES,M 470-J-1/10
R1580	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R1581	ERJ6GEYJ223	RES,M 22K-J-1/10
R1587	ERJ6GEYJ102	RES,M 1K-J-1/10
R1588	ERJ6GEYJ223	RES,M 22K-J-1/10
R1589	ERJ6GEYJ103	RES,M 10K-J-1/10
R1591	ERJ6GEYJ102	RES,M 1K-J-1/10

REF NO.	PART NO.	DESCRIPTION
R1592	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R1593	ERJ6GEYJ151	RES,M 150-J-1/10
R1594	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R1595	ERJ6GEYJ471	RES,M 470-J-1/10
R1596	ERJ6GEYJ102	RES,M 1K-J-1/10
R1600	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R1601	ERJ6GEYJ473	RES,M 47K-J-1/10
R1602	ERJ6GEYJ223	RES,M 22K-J-1/10
R1603	ERJ6GEYJ103	RES,M 10K-J-1/10
R1701	ERDS2TJ682	RES,C 6.8K-J-1/4
R1702	ERDS2TJ562	RES,C 5.6K-J-1/4
R1703	ERDS2TJ222	RES,C 2.2K-J-1/4
R1704	ERDS2TJ222	RES,C 2.2K-J-1/4
R1705	ER0S2CKF2001	RES,M 2K-F-1/4W
R1706	ERDS2TJ510	RES,C 51-J-1/4W
R1707	ER0S2CKF7501	RES,M 7.5K-F-1/4
R1709	ERDS2TJ223	RES,C 22K-J-1/4
R1711	ER0S2CKF9091	RES,M 9.09K-F-1/4W
R1712	ERDS2TJ223	RES,C 22K-J-1/4
R1713	ERDS2TJ103	RES,C 10K-J-1/4
R1714	ERDS2TJ103	RES,C 10K-J-1/4
R1715	ERDS2TJ103	RES,C 10K-J-1/4
R1716	ERDS2TJ102	RES,C 1K-J-1/4
R1717	ER0S2CKF2001	RES,M 2K-F-1/4W
R1718	ER0S2CKF3011	RES,M 3.01K-F-1/4
R1719	ERDS2TJ510	RES,C 51-J-1/4W
R1720	ER0S2CKF9091	RES,M 9.09K-F-1/4W
R1721	ERDS2TJ392	RES,C 3.9K-J-1/4
R1723	ERDS2TJ103	RES,C 10K-J-1/4
R1725	ER0S2CKF5101	RES,M 5.1K-F-1/4
R1729	ERDS2TJ103	RES,C 10K-J-1/4
R1730	ERDS2TJ103	RES,C 10K-J-1/4
R1732	ERDS2TJ102	RES,C 1K-J-1/4
R1733	ERDS2TJ152	RES,C 1.5K-J-1/4
R1734	ERDS2TJ330	RES,C 33-J-1/4
R1736	ERG3FJ681H	RES,M 680-J-3W
R1737	ERDS2TJ100	RES,C 10-J-1/4
R1738	ERDS2TJ100	RES,C 10-J-1/4
R1739	ERDS2TJ683	RES,C 68K-J-1/4
R1740	ERDS2TJ122	RES,C 1.2K-J-1/4
R1742	ERG2FJ823H	RES,M 82K-J-2W
R1743	ERDS1TJ225	RES,C 2.2MEG-J-1/2
R1744	ERDS2TJ102	RES,C 1K-J-1/4
R1745	ERDS2TJ912	RES,C 9.1K-J-1/4
R1746	ERG2FJ823H	RES,M 82K-J-2W
R1747	ERDS1TJ105	RES,C 1MEG-J-1/2
R1748	ERG2FJ823H	RES,M 82K-J-2W
R1749	ERDS2TJ332	RES,C 3.3K-J-1/4
R1750	ERDS2TJ122	RES,C 1.2K-J-1/4
R1752	ERG3SJ153	RES,M 15K-J-3W
R1761	ERDS2TJ103	RES,C 10K-J-1/4

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R1762	ERDS2TJ101	RES,C 100-J-1/4
R1763	ERDS2TJ223	RES,C 22K-J-1/4
R1764	ERDS2TJ225	RES,C 2.2MEG-J-1/4
R1765	ERDS2TJ473	RES,C 47K-J-1/4
R1766	ERDS1TJ224	RES,C 200K-J-1/2
R1767	ERDS2TJ332	RES,C 3.3K-J-1/4
R1768	ERDS2TJ103	RES,C 10K-J-1/4
R1772	ERJ6GEYJ101	RES,M 100-J-1/10
R1773	ERJ6GEYJ101	RES,M 100-J-1/10
R1774	ERJ6GEYJ101	RES,M 100-J-1/10
R1775	ERJ6GEYJ101	RES,M 100-J-1/10
R1776	ERJ6GEYJ101	RES,M 100-J-1/10
R1777	ERJ6GEYJ101	RES,M 100-J-1/10
R1779	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R1801	ERJ6GEYJ301	RES,M 300-J-1/10
R1802	ERJ6GEYJ104	RES,M 100K-J-1/10
R1803	ERJ6GEYJ474	RES,M 470K-J-1/10
R1804	ERJ6GEYJ202	RES,M 2K-J-1/10
R1805	ERJ6GEYJ102	RES,M 1K-J-1/10
R1807	ERJ6GEYJ103	RES,M 10K-J-1/10
R1808	ERJ6GEYJ103	RES,M 10K-J-1/10
R1809	ERJ6GEYJ473	RES,M 47K-J-1/10
R1810	ERJ6GEYJ103	RES,M 10K-J-1/10
R1811	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R1812	ERJ6GEYJ153	RES,M 15K-J-1/10
R1813	ERJ6GEYJ153	RES,M 15K-J-1/10
R1814	ERJ6GEYJ271	RES,M 270-J-1/10
R1815	ERJ6GEYJ361	RES,M 360-J-1/10
R1818	ERJ6GEYJ101	RES,M 100-J-1/10
R1819	ERJ6GEYJ101	RES,M 100-J-1/10
R1822	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R1823	ERJ6GEYJ473	RES,M 47K-J-1/10
R1825	ERJ6GEYJ471	RES,M 470-J-1/10
R1827	ERJ6GEYJ102	RES,M 1K-J-1/10
R1828	ERJ6GEYJ821	RES,M 820-J-1/10
R1829	ERJ6GEYJ102	RES,M 1K-J-1/10
R1830	ERJ6GEYJ102	RES,M 1K-J-1/10
R1856	ERJ6GEYJ153	RES,M 15K-J-1/10
R2106	ERDS2TJ183	RES,C 18K-J-1/4
R2109	ERJ6GEYJ683	RES,M 68K-J-1/10
R2110	ERJ6GEYJ331	RES,M 330-J-1/10
R2111	ERJ6GEYJ152	RES,M 1.5K-J-1/10
R2112	ERJ6GEYJ331	RES,M 330-J-1/10
R2113	ERJ6GEYJ102	RES,M 1K-J-1/10
R2114	ERJ6GEYJ221	RES,M 220-J-1/10
R2115	EVND8AA03B33	CONTROL 3K
R2117	ERJ6GEYJ121	RES,M 120-J-1/10
R2118	EVND8AA03B33	CONTROL 3K
R2119	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R2121	ERJ6GEYJ471	RES,M 470-J-1/10
R2122	ERJ6GEYJ473	RES,M 47K-J-1/10

REF NO.	PART NO.	DESCRIPTION
R2123	ERJ6GEYJ473	RES,M 47K-J-1/10
R2124	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R2127	ERJ6GEYJ101	RES,M 100-J-1/10
R2129	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R2201	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R2202	ERJ6GEYJ153	RES,M 15K-J-1/10
R2203	ERJ6GEYJ104	RES,M 100K-J-1/10
R2204	ERJ6GEYJ473	RES,M 47K-J-1/10
R2205	ERJ6GEYJ154	RES,M 150K-J-1/10
R2208	ERJ6ENF9102	RES,M 91K-F-1/10
R2212	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R2230	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R2231	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2301	ERJ6GEYJ473	RES,M 47K-J-1/10
R2302	ERJ6GEYJ473	RES,M 47K-J-1/10
R2303	ERJ6GEYJ103	RES,M 10K-J-1/10
R2304	ERJ6GEYJ103	RES,M 10K-J-1/10
R2305	ERD25FJ2R2	RES,C 2.2-J-1/4
R2306	ERD25FJ2R2	RES,C 2.2-J-1/4
R2307	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2310	ERJ6GEYJ223	RES,M 22K-J-1/10
R2311	ERJ6GEYJ271	RES,M 270-J-1/10
R2312	ERJ6GEYJ271	RES,M 270-J-1/10
R2321	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R2323	ERJ6GEYJ223	RES,M 22K-J-1/10
R2324	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R2325	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R2326	ERJ6GEYJ102	RES,M 1K-J-1/10
R2327	ERJ6GEYJ101	RES,M 100-J-1/10
R2331	ERJ6GEYJ102	RES,M 1K-J-1/10
R2332	ERJ6GEYJ473	RES,M 47K-J-1/10
R2333	ERJ6GEYJ102	RES,M 1K-J-1/10
R2334	ERJ6GEYJ103	RES,M 10K-J-1/10
R2335	ERJ6GEYJ183	RES,M 18K-J-1/10
R2336	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R2337	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R2338	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R2339	ERJ6GEYJ183	RES,M 18K-J-1/10
R2340	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R2345	ERJ6GEYJ103	RES,M 10K-J-1/10
R2346	ERJ6GEYJ102	RES,M 1K-J-1/10
R2347	ERJ6GEYJ473	RES,M 47K-J-1/10
R2348	ERJ6GEYJ102	RES,M 1K-J-1/10
R2351	ERJ6GEYJ224	RES,M 220K-J-1/10
R2352	ERJ6GEYJ154	RES,M 150K-J-1/10
R2402	ERDS2TJ473	RES,C 47K-J-1/4
R2404	ERDS2TJ103	RES,C 10K-J-1/4
R2405	ERD25FJ2R2	RES,C 2.2-J-1/4
R2407	ERDS2TJ562	RES,C 5.6K-J-1/4
R2432	ERDS2TJ223	RES,C 22K-J-1/4
R2434	ERDS2TJ271	RES,C 270-J-1/4

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

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REF NO.	PART NO.	DESCRIPTION
R2436	ERDS2TJ271	RES,C 270-J-1/4
R2472	ERJ6GEYJ104	RES,M 100K-J-1/10
R2478	ERJ6GEYJ153	RES,M 15K-J-1/10
R2479	ERJ6GEYJ153	RES,M 15K-J-1/10
R2480	ERJ6GEYJ153	RES,M 15K-J-1/10
R2484	ERJ6GEYJ124	RES,M 120K-J-1/10
R2489	ERJ6GEYJ153	RES,M 15K-J-1/10
R2490	ERJ6GEYJ104	RES,M 100K-J-1/10
R2491	ERJ6GEYJ153	RES,M 15K-J-1/10
R2492	ERJ6GEYJ683	RES,M 68K-J-1/10
R2493	ERJ6GEYJ683	RES,M 68K-J-1/10
R2601	ERJ6GEYJ101	RES,M 100-J-1/10
R2602	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2604	ERJ6GEYJ101	RES,M 100-J-1/10
R2605	ERJ6GEYJ101	RES,M 100-J-1/10
R2606	ERJ6GEYJ101	RES,M 100-J-1/10
R2607	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R2608	ERJ6ENF2002	RES,M 20K-F-1/10
R2609	ERJ6GEYJ101	RES,M 100-J-1/10
R2610	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R2611	ERJ6ENF3002	RES,M 30K-F-1/10W
R2612	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R2613	ERJ6GEYJ101	RES,M 100-J-1/10
R2615	ERJ6GEYJ101	RES,M 100-J-1/10
R2616	ERJ6GEYJ101	RES,M 100-J-1/10
R2617	ERJ6GEYJ101	RES,M 100-J-1/10
R2618	ERJ6GEYJ471	RES,M 470-J-1/10
R2619	ERJ6GEYJ471	RES,M 470-J-1/10
R2620	ERJ6GEYJ471	RES,M 470-J-1/10
R2621	ERJ6GEYJ273	RES,M 27K-J-1/10
R2622	ERJ6GEYJ274	RES,M 270K-J-1/10
R2623	ERJ6GEYJ563	RES,M 56K-J-1/10
R2624	ERJ6ENF3001	RES,M 3K-F-1/10
R2625	ERJ6ENF1501	RES,M 1.5K-F-1/10
R2626	ERJ6GEYJ101	RES,M 100-J-1/10
R2627	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R2628	ERJ6GEYJ101	RES,M 100-J-1/10
R2629	ERJ6GEYJ101	RES,M 100-J-1/10
R2632	ERJ6GEYJ101	RES,M 100-J-1/10
R2633	ERJ6GEYJ271	RES,M 270-J-1/10
R2634	ERJ6GEYJ100	RES,M 10-J-1/10
R2635	ERJ6GEYJ220	RES,M 22-J-1/10
R2636	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2637	ERJ6GEYJ102	RES,M 1K-J-1/10
R2638	ERJ6GEYJ103	RES,M 10K-J-1/10
R2639	ERJ6GEYJ101	RES,M 100-J-1/10
R2640	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R2642	ERJ6GEYJ101	RES,M 100-J-1/10
R2643	ERJ6GEYJ271	RES,M 270-J-1/10
R2644	ERJ6GEYJ100	RES,M 10-J-1/10
R2645	ERJ6GEYJ220	RES,M 22-J-1/10

REF NO.	PART NO.	DESCRIPTION
R2652	ERJ6GEYJ101	RES,M 100-J-1/10
R2653	ERJ6GEYJ271	RES,M 270-J-1/10
R2654	ERJ6GEYJ100	RES,M 10-J-1/10
R2655	ERJ6GEYJ220	RES,M 22-J-1/10
R2661	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2663	ERJ6GEYJ101	RES,M 100-J-1/10
R2664	ERJ6GEYJ101	RES,M 100-J-1/10
R2665	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2667	ERJ6GEYJ471	RES,M 470-J-1/10
R2668	ERJ6GEYJ102	RES,M 1K-J-1/10
R2669	ERJ6GEYJ560	RES,M 56-J-1/10
R2672	ERJ6GEYJ101	RES,M 100-J-1/10
R2673	ERJ6GEYJ101	RES,M 100-J-1/10
R2676	ERJ6ENF6802	RES,M 68K-F-1/10W
R2677	ERJ6ENF7501	RES,M 7.5K-F-1/10W
R2678	ERJ6ENF2201	RES,M 2.2K-F-1/10
R2680	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2681	ERJ6GEYJ471	RES,M 470-J-1/10
R2682	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R2683	ERJ6GEYJ221	RES,M 220-J-1/10
R2684	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2686	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2687	ERJ6GEYJ471	RES,M 470-J-1/10
R2688	ERJ6GEYJ751	RES,M 750-J-1/10
R2689	ERJ6ENF1500	RES,M 150-F-1/10
R2690	ERJ6ENF1500	RES,M 150-F-1/10
R2692	ERJ6GEYJ751	RES,M 750-J-1/10
R2693	ERJ6ENF3241	RES,M 3.24K-F-1/10
R2694	ERJ6ENF3001	RES,M 3K-F-1/10
R2695	ERJ6ENF3600	RES,M 360-F-1/10W
R2696	ERJ6GEYJ471	RES,M 470-J-1/10
R2697	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R2698	ERJ6GEYJ560	RES,M 56-J-1/10
R2699	ERJ6GEYJ331	RES,M 330-J-1/10
R2703	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R2704	ERJ6GEYJ221	RES,M 220-J-1/10
R2705	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R2706	ERJ6GEYJ102	RES,M 1K-J-1/10
R2707	ERJ6GEYJ102	RES,M 1K-J-1/10
R2708	ERJ6GEYJ563	RES,M 56K-J-1/10
R2709	ERJ6GEYJ393	RES,M 39K-J-1/10
R2710	ERJ6GEYJ471	RES,M 470-J-1/10
R2711	ERJ6GEYJ102	RES,M 1K-J-1/10
R2712	ERJ6GEYJ101	RES,M 100-J-1/10
R2714	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2716	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R2717	ERJ6GEYJ331	RES,M 330-J-1/10
R2719	ERJ6GEYJ331	RES,M 330-J-1/10
R2721	ERJ6GEYJ101	RES,M 100-J-1/10
R2722	ERJ6GEYJ331	RES,M 330-J-1/10
R2724	ERJ6GEYJ331	RES,M 330-J-1/10

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R2726	ERJ6GEYJ223	RES,M 22K-J-1/10
R2727	ERJ6GEYJ473	RES,M 47K-J-1/10
R2728	ERJ6GEYJ473	RES,M 47K-J-1/10
R2731	ERJ6GEYJ102	RES,M 1K-J-1/10
R2732	ERJ6GEYJ471	RES,M 470-J-1/10
R2733	ERJ6ENF1800	RES,M 180-F-1/10W
R2734	ERJ6ENF4300	RES,M 430-F-1/10W
R2741	ERJ6GEYJ102	RES,M 1K-J-1/10
R2742	ERJ6GEYJ471	RES,M 470-J-1/10
R2743	ERJ6ENF2200	RES,M 220-F-1/10W
R2744	ERJ6ENF4300	RES,M 430-F-1/10W
R2751	ERJ6GEYJ102	RES,M 1K-J-1/10
R2752	ERJ6GEYJ471	RES,M 470-J-1/10
R2753	ERJ6ENF2200	RES,M 220-F-1/10W
R2754	ERJ6ENF4300	RES,M 430-F-1/10W
R2761	ERJ6GEYJ471	RES,M 470-J-1/10
R2762	ERJ6GEYJ102	RES,M 1K-J-1/10
R2763	ERJ6GEYJ102	RES,M 1K-J-1/10
R2771	ERJ6GEYJ393	RES,M 39K-J-1/10
R2772	ERJ6GEYJ393	RES,M 39K-J-1/10
R2773	ERJ6GEYJ393	RES,M 39K-J-1/10
R2774	ERJ6GEYJ393	RES,M 39K-J-1/10
R2775	ERJ6GEYJ101	RES,M 100-J-1/10
R2776	ERJ6GEYJ101	RES,M 100-J-1/10
R2781	ERJ6GEYJ393	RES,M 39K-J-1/10
R2782	ERJ6GEYJ393	RES,M 39K-J-1/10
R2786	ERJ6GEYJ102	RES,M 1K-J-1/10
R2787	ERJ6GEYJ102	RES,M 1K-J-1/10
R2788	ERJ6GEYJ102	RES,M 1K-J-1/10
R3001	ERJ6GEYJ221	RES,M 220-J-1/10
R3002	ERJ6GEYJ102	RES,M 1K-J-1/10
R3003	ERJ6GEYJ221	RES,M 220-J-1/10
R3004	ERJ6GEYJ102	RES,M 1K-J-1/10
R3005	ERJ6GEYJ221	RES,M 220-J-1/10
R3006	ERJ6GEYJ221	RES,M 220-J-1/10
R3007	ERJ6GEYJ102	RES,M 1K-J-1/10
R3008	ERJ6GEYJ221	RES,M 220-J-1/10
R3009	ERJ6GEYJ102	RES,M 1K-J-1/10
R3010	ERJ6GEYJ221	RES,M 220-J-1/10
R3011	ERJ6GEYJ221	RES,M 220-J-1/10
R3012	ERJ6GEYJ102	RES,M 1K-J-1/10
R3014	ERJ6GEYJ102	RES,M 1K-J-1/10
R3016	ERJ6GEYJ221	RES,M 220-J-1/10
R3017	ERJ6GEYJ102	RES,M 1K-J-1/10
R3018	ERJ6GEYJ221	RES,M 220-J-1/10
R3019	ERJ6GEYJ102	RES,M 1K-J-1/10
R3021	ERJ6GEYJ221	RES,M 220-J-1/10
R3022	ERJ6GEYJ221	RES,M 220-J-1/10
R3023	ERJ6GEYJ102	RES,M 1K-J-1/10
R3024	ERJ6GEYJ221	RES,M 220-J-1/10
R3025	ERJ6GEYJ102	RES,M 1K-J-1/10

REF NO.	PART NO.	DESCRIPTION
R3026	ERJ6GEYJ102	RES,M 1K-J-1/10
R3027	ERJ6GEYJ221	RES,M 220-J-1/10
R3028	ERJ6GEYJ102	RES,M 1K-J-1/10
R3031	ERJ6GEYJ471	RES,M 470-J-1/10
R3033	ERJ6GEYJ681	RES,M 680-J-1/10
R3034	ERJ6GEYJ471	RES,M 470-J-1/10
R3036	ERJ6GEYJ681	RES,M 680-J-1/10
R3037	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R3038	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R3039	ERJ6GEYJ681	RES,M 680-J-1/10
R3042	ERJ6GEYJ221	RES,M 220-J-1/10
R3045	ERJ6GEYJ101	RES,M 100-J-1/10
R3051	ERJ6GEYJ103	RES,M 10K-J-1/10
R3052	ERJ6GEYJ333	RES,M 33K-J-1/10
R3053	ERJ6GEYJ221	RES,M 220-J-1/10
R3054	ERJ6GEYJ333	RES,M 33K-J-1/10
R3055	ERJ6GEYJ103	RES,M 10K-J-1/10
R3056	ERJ6GEYJ221	RES,M 220-J-1/10
R3057	ERJ6GEYJ471	RES,M 470-J-1/10
R3058	ERJ6GEYJ331	RES,M 330-J-1/10
R3065	ERJ6GEYJ680	RES,M 68-J-1/10
R3073	ERJ6GEYJ103	RES,M 10K-J-1/10
R3075	ERJ6GEYJ184	RES,M 180K-J-1/10
R3076	ERJ6GEYJ184	RES,M 180K-J-1/10
R3079	ERJ6GEYJ103	RES,M 10K-J-1/10
R3081	ERJ6GEYJ184	RES,M 180K-J-1/10
R3082	ERJ6GEYJ184	RES,M 180K-J-1/10
R3085	ERJ6GEYJ103	RES,M 10K-J-1/10
R3087	ERJ6GEYJ184	RES,M 180K-J-1/10
R3088	ERJ6GEYJ184	RES,M 180K-J-1/10
R3101	ERJ6GEYJ184	RES,M 180K-J-1/10
R3102	ERJ6GEYJ184	RES,M 180K-J-1/10
R3111	ERJ6GEYJ183	RES,M 18K-J-1/10
R3112	ERJ6GEYJ103	RES,M 10K-J-1/10
R3113	ERJ6GEYJ471	RES,M 470-J-1/10
R3114	ERJ6GEYJ471	RES,M 470-J-1/10
R3115	ERJ6ENF2400	RES,M 240-F-1/10W
R3116	ERJ6GEYJ220	RES,M 22-J-1/10
R3117	ERJ6ENF6800	RES,M 680-F-1/10
R3118	ERJ6GEYJ471	RES,M 470-J-1/10
R3119	ERJ6GEYJ471	RES,M 470-J-1/10
R3120	ERJ6GEYJ471	RES,M 470-J-1/10
R3121	ERJ6GEYJ243	RES,M 24K-J-1/10
R3122	ERJ6GEYJ183	RES,M 18K-J-1/10
R3131	ERJ6GEYJ183	RES,M 18K-J-1/10
R3132	ERJ6GEYJ103	RES,M 10K-J-1/10
R3133	ERJ6GEYJ471	RES,M 470-J-1/10
R3134	ERJ6GEYJ471	RES,M 470-J-1/10
R3135	ERJ6ENF2200	RES,M 220-F-1/10W
R3136	ERJ6GEYJ220	RES,M 22-J-1/10
R3137	ERJ6ENF6800	RES,M 680-F-1/10

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R3138	ERJ6GEYJ471	RES,M 470-J-1/10
R3139	ERJ6GEYJ471	RES,M 470-J-1/10
R3140	ERJ6GEYJ471	RES,M 470-J-1/10
R3151	ERJ6GEYJ183	RES,M 18K-J-1/10
R3152	ERJ6GEYJ103	RES,M 10K-J-1/10
R3153	ERJ6GEYJ471	RES,M 470-J-1/10
R3154	ERJ6GEYJ471	RES,M 470-J-1/10
R3155	ERJ6ENF2200	RES,M 220-F-1/10W
R3156	ERJ6GEYJ220	RES,M 22-J-1/10
R3157	ERJ6ENF6800	RES,M 680-F-1/10
R3158	ERJ6GEYJ471	RES,M 470-J-1/10
R3159	ERJ6GEYJ471	RES,M 470-J-1/10
R3160	ERJ6GEYJ471	RES,M 470-J-1/10
R3189	ERJ6GEYJ333	RES,M 33K-J-1/10
R3190	ERJ6GEYJ152	RES,M 1.5K-J-1/10
R3191	ERJ6GEYJ223	RES,M 22K-J-1/10
R3192	ERJ6GEYJ223	RES,M 22K-J-1/10
R3193	ERJ6GEYJ104	RES,M 100K-J-1/10
R3194	ERJ6GEYJ103	RES,M 10K-J-1/10
R3195	ERJ6GEYJ473	RES,M 47K-J-1/10
R3196	ERJ6GEYJ104	RES,M 100K-J-1/10
R3197	ERJ6GEYJ104	RES,M 100K-J-1/10
R3198	ERJ6GEYJ104	RES,M 100K-J-1/10
R3451	ERJ6GEYJ750	RES,M 75-J-1/10
R3452	ERJ6GEYJ224	RES,M 220K-J-1/10
R3453	ERJ6GEYJ750	RES,M 75-J-1/10
R3454	ERJ6GEYJ224	RES,M 220K-J-1/10
R3455	ERJ6GEYJ750	RES,M 75-J-1/10
R3802	**ERC12ZGM825**	**RES,S 8.2MEG-M-1/2**
R3803	ERC14GK105	RES,C 1MEG-K-1/4W
R3828	ERD25FJ101	RES,C 100-J-1/4
R3833	ERDS2TJ472	RES,C 4.7K-J-1/4
R3834	ERDS2TJ103	RES,C 10K-J-1/4
R4310	ERJ6GEYJ103	RES,M 10K-J-1/10
R4311	ERJ6GEYJ103	RES,M 10K-J-1/10
R4326	ERD25TJ471	RES,C 470-J-1/4
R4327	ERJ6GEYJ331	RES,M 330-J-1/10
R4328	ERJ6GEYJ560	RES,M 56-J-1/10
R4329	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R4330	ERJ6GEYJ561	RES,M 560-J-1/10
R4331	ERJ6GEYJ471	RES,M 470-J-1/10
R4332	ERJ6GEYJ393	RES,M 39K-J-1/10
R4333	ERJ6GEYJ304	RES,M 300K-J-1/10
R4334	ERJ6GEYJ152	RES,M 1.5K-J-1/10
R4336	ERJ6GEYJ680	RES,M 68-J-1/10
R4337	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R4338	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R4339	ERJ6GEYJ102	RES,M 1K-J-1/10
R4340	ERJ6GEYJ334	RES,M 330K-J-1/10
R4342	ERJ6GEYJ223	RES,M 22K-J-1/10
R4344	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R4345	ERJ6GEYJ103	RES,M 10K-J-1/10
R6501	ERJ6GEYJ560	RES,M 56-J-1/10
R6502	ERJ6GEYJ560	RES,M 56-J-1/10
R6503	ERJ6GEYJ560	RES,M 56-J-1/10
R6504	ERJ6GEYJ560	RES,M 56-J-1/10
R6505	ERJ6GEYJ560	RES,M 56-J-1/10
R6506	ERJ6GEYJ560	RES,M 56-J-1/10
R6507	ERJ6GEYJ560	RES,M 56-J-1/10
R6508	ERJ6GEYJ560	RES,M 56-J-1/10
R6511	ERJ6GEYJ102	RES,M 1K-J-1/10
R6512	ERJ6GEYJ102	RES,M 1K-J-1/10
R6513	ERJ6GEYJ471	RES,M 470-J-1/10
R6514	ERJ6GEYJ473	RES,M 47K-J-1/10
R6515	ERJ6GEYJ473	RES,M 47K-J-1/10
R6516	ERJ6GEYJ471	RES,M 470-J-1/10
R6518	ERJ6GEYJ681	RES,M 680-J-1/10
R6519	ERJ6GEYJ102	RES,M 1K-J-1/10
R6520	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R6521	ERJ6GEYJ102	RES,M 1K-J-1/10
R6522	ERJ6GEYJ681	RES,M 680-J-1/10
R6523	ERJ6GEYJ221	RES,M 220-J-1/10
R6524	ERJ6GEYJ103	RES,M 10K-J-1/10
R6525	ERJ6GEYJ333	RES,M 33K-J-1/10
R6526	ERJ6GEYJ333	RES,M 33K-J-1/10
R6527	ERJ6GEYJ152	RES,M 1.5K-J-1/10
R6528	ERJ6GEYJ123	RES,M 12K-J-1/10
R6529	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R6530	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R6531	ERJ6GEYJ102	RES,M 1K-J-1/10
R6532	ERJ6GEYJ393	RES,M 39K-J-1/10
R6533	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R6535	ERJ6GEYJ471	RES,M 470-J-1/10
R6536	ERJ6GEYJ471	RES,M 470-J-1/10
R6537	ERJ6GEYJ821	RES,M 820-J-1/10
R6538	ERJ6GEYJ223	RES,M 22K-J-1/10
R6539	ERJ6GEYJ473	RES,M 47K-J-1/10
R6540	ERJ6GEYJ471	RES,M 470-J-1/10
R6541	ERJ6GEYJ561	RES,M 560-J-1/10
R6542	ERJ6GEYJ561	RES,M 560-J-1/10
R6543	ERJ6GEYJ681	RES,M 680-J-1/10
R6544	ERJ6GEYJ473	RES,M 47K-J-1/10
R6545	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R6546	ERJ6GEYJ223	RES,M 22K-J-1/10
R6547	ERJ6GEYJ223	RES,M 22K-J-1/10
R6549	ERJ6GEYJ103	RES,M 10K-J-1/10
R6550	ERJ6GEYJ223	RES,M 22K-J-1/10
R6551	ERJ6GEYJ821	RES,M 820-J-1/10
R6552	ERJ6GEYJ223	RES,M 22K-J-1/10
R6553	ERJ6GEYJ471	RES,M 470-J-1/10
R6554	ERJ6GEYJ154	RES,M 150K-J-1/10
R6555	ERJ6GEYJ104	RES,M 100K-J-1/10

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R6556	ERJ6GEYJ513	RES,M 51K-J-1/10
R6557	ERJ6GEYJ243	RES,M 24K-J-1/10
R6559	ERJ6GEYJ223	RES,M 22K-J-1/10
R6561	ERJ6GEYJ223	RES,M 22K-J-1/10
R6562	ERJ6GEYJ681	RES,M 680-J-1/10
R6563	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R6564	ERJ6GEYJ202	RES,M 2K-J-1/10
R6565	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R6566	ERJ6GEYJ431	RES,M 430-J-1/10
R6567	ERJ6GEYJ471	RES,M 470-J-1/10
R6568	ERJ6GEYJ202	RES,M 2K-J-1/10
R6570	ERJ6GEYJ102	RES,M 1K-J-1/10
R6571	ERJ6GEYJ680	RES,M 68-J-1/10
R6572	ERJ6GEYJ220	RES,M 22-J-1/10
R6573	ERJ6GEYJ220	RES,M 22-J-1/10
R6574	ERJ6GEYJ560	RES,M 56-J-1/10
R6575	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R6576	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R6577	ERJ6GEYJ153	RES,M 15K-J-1/10
R6578	ERJ6GEYJ333	RES,M 33K-J-1/10
R6579	ERJ6GEYJ102	RES,M 1K-J-1/10
R6580	ERJ6GEYJ301	RES,M 300-J-1/10
R6581	ERJ6GEYJ471	RES,M 470-J-1/10
R6582	ERJ6GEYJ102	RES,M 1K-J-1/10
R6583	ERJ6GEYJ101	RES,M 100-J-1/10
R6589	ERJ6GEYJ102	RES,M 1K-J-1/10
R6590	ERJ6GEYJ680	RES,M 68-J-1/10
R8001	ERJ6GEYJ681	RES,M 680-J-1/10
R8002	ERJ6GEYJ681	RES,M 680-J-1/10
R8003	ERJ6GEYJ101	RES,M 100-J-1/10
R8004	ERJ6GEYJ101	RES,M 100-J-1/10
R8005	ERJ6GEYJ102	RES,M 1K-J-1/10
R8006	ERJ6GEYJ102	RES,M 1K-J-1/10
R8007	ERJ6GEYJ102	RES,M 1K-J-1/10
R8008	ERJ6GEYJ101	RES,M 100-J-1/10
R8009	ERJ6ENF82R0	RES,M 82-F-1/10W
R8010	ERJ6ENF1001	RES,M 1K-F-1/10
R8011	ERJ6ENF15R0	RES,M 15.0-F-1/10W
R8012	ERJ6GEYJ103	RES,M 10K-J-1/10
R8013	ERJ6GEYJ103	RES,M 10K-J-1/10
R8014	ERJ6ENF82R0	RES,M 82-F-1/10W
R8015	ERJ6ENF1001	RES,M 1K-F-1/10
R8016	ERJ6ENF15R0	RES,M 15.0-F-1/10W
R8017	ERJ6GEYJ103	RES,M 10K-J-1/10
R8018	ERJ6GEYJ103	RES,M 10K-J-1/10
R8019	ERJ6ENF82R0	RES,M 82-F-1/10W
R8020	ERJ6ENF1001	RES,M 1K-F-1/10
R8021	ERJ6ENF15R0	RES,M 15.0-F-1/10W
R8022	ERJ6GEYJ103	RES,M 10K-J-1/10
R8023	ERJ6GEYJ103	RES,M 10K-J-1/10
R8024	ERJ6ENF3600	RES,M 360-F-1/10W

REF NO.	PART NO.	DESCRIPTION
R8025	ERJ6ENF1000	RES,M 100-F-1/10
R8026	ERJ6ENF1000	RES,M 100-F-1/10
R8027	ERJ6GEYJ101	RES,M 100-J-1/10
R8028	ERJ6GEYJ101	RES,M 100-J-1/10
R8029	ERJ6GEYJ471	RES,M 470-J-1/10
R8030	ERJ6GEYJ471	RES,M 470-J-1/10
R8031	ERJ6ENF5600	RES,M 560-F-1/10W
R8032	ERJ6ENF2200	RES,M 220-F-1/10W
R8033	ERJ6ENF5600	RES,M 560-F-1/10W
R8034	ERJ6ENF1500	RES,M 150-F-1/10
R8035	ERJ6ENF1001	RES,M 1K-F-1/10
R8036	ERJ6ENF1001	RES,M 1K-F-1/10
R8037	ERJ6ENF1500	RES,M 150-F-1/10
R8038	ERJ6GEYJ272	RES,M 2.7K-J-1/10
R8039	ERJ6ENF1000	RES,M 100-F-1/10
R8040	ERJ6ENF1500	RES,M 150-F-1/10
R8041	ERJ6ENF1500	RES,M 150-F-1/10
R8042	ERJ6ENF1500	RES,M 150-F-1/10
R8045	ERJ6GEYJ471	RES,M 470-J-1/10
R8046	ERJ6GEYJ471	RES,M 470-J-1/10
R8053	ERJ6GEYJ470	RES,M 47-J-1/10
R8054	ERJ6GEYJ471	RES,M 470-J-1/10
R8055	ERJ6GEYJ471	RES,M 470-J-1/10
R8056	ERJ6ENF1201	RES,M 1.2K-F-1/10
R8057	ERJ6ENF1001	RES,M 1K-F-1/10
R8058	ERJ6GEYJ105	RES,M 1.0MEG-J-1/10
R8059	ERJ6ENF2201	RES,M 2.2K-F-1/10
R8061	ERJ6GEYJ103	RES,M 10K-J-1/10
R8062	ERJ6GEYJ103	RES,M 10K-J-1/10
R8063	ERJ6GEYJ103	RES,M 10K-J-1/10
R8064	ERJ6GEYJ103	RES,M 10K-J-1/10
R8065	ERJ6GEYJ103	RES,M 10K-J-1/10
R8066	ERJ6GEYJ103	RES,M 10K-J-1/10
R8067	ERJ6GEYJ272	RES,M 2.7K-J-1/10
R8068	ERJ6GEYJ301	RES,M 300-J-1/10
R8069	ERJ6GEYJ103	RES,M 10K-J-1/10
R8070	ERJ6GEYJ333	RES,M 33K-J-1/10
R8071	ERJ6GEYJ101	RES,M 100-J-1/10
R8072	ERJ6GEYJ103	RES,M 10K-J-1/10
R8073	ERJ6GEYJ103	RES,M 10K-J-1/10
R8074	ERJ6GEYJ103	RES,M 10K-J-1/10
R8081	ERJ6GEYJ101	RES,M 100-J-1/10
R8082	ERJ6GEYJ101	RES,M 100-J-1/10
R8083	ERJ6GEYJ103	RES,M 10K-J-1/10
R8084	ERJ6GEYJ103	RES,M 10K-J-1/10
R8085	ERJ6GEYJ101	RES,M 100-J-1/10
R8086	ERJ6GEYJ103	RES,M 10K-J-1/10
R8101	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R8102	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R8103	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R8106	ERJ6GEYJ102	RES,M 1K-J-1/10

REPLACEMENT PARTS LIST

Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R8111	ERJ6GEYJ223	RES,M 22K-J-1/10
R8112	ERJ6GEYJ223	RES,M 22K-J-1/10
R8113	ERJ6GEYJ471	RES,M 470-J-1/10
R8114	ERJ6GEYJ102	RES,M 1K-J-1/10
R8115	ERJ6GEYJ221	RES,M 220-J-1/10
R8116	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R8117	ERJ6GEYJ471	RES,M 470-J-1/10
R8118	ERJ6GEYJ471	RES,M 470-J-1/10
R8121	ERJ6GEYJ223	RES,M 22K-J-1/10
R8122	ERJ6GEYJ223	RES,M 22K-J-1/10
R8123	ERJ6GEYJ471	RES,M 470-J-1/10
R8124	ERJ6GEYJ102	RES,M 1K-J-1/10
R8125	ERJ6GEYJ221	RES,M 220-J-1/10
R8126	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R8127	ERJ6GEYJ471	RES,M 470-J-1/10
R8128	ERJ6GEYJ471	RES,M 470-J-1/10
R8131	ERJ6GEYJ223	RES,M 22K-J-1/10
R8132	ERJ6GEYJ223	RES,M 22K-J-1/10
R8133	ERJ6GEYJ471	RES,M 470-J-1/10
R8134	ERJ6GEYJ102	RES,M 1K-J-1/10
R8135	ERJ6GEYJ221	RES,M 220-J-1/10
R8136	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R8137	ERJ6GEYJ471	RES,M 470-J-1/10
R8138	ERJ6GEYJ471	RES,M 470-J-1/10
R8141	ERJ6GEYJ221	RES,M 220-J-1/10
R8142	ERJ6GEYJ393	RES,M 39K-J-1/10
R8143	ERJ6GEYJ101	RES,M 100-J-1/10
R8144	ERJ6GEYJ102	RES,M 1K-J-1/10
R8151	ERJ6GEYJ221	RES,M 220-J-1/10
R8152	ERJ6GEYJ393	RES,M 39K-J-1/10
R8153	ERJ6GEYJ101	RES,M 100-J-1/10
R8154	ERJ6GEYJ102	RES,M 1K-J-1/10
R8161	ERJ6GEYJ221	RES,M 220-J-1/10
R8162	ERJ6GEYJ393	RES,M 39K-J-1/10
R8163	ERJ6GEYJ101	RES,M 100-J-1/10
R8164	ERJ6GEYJ102	RES,M 1K-J-1/10
R8171	ERJ6GEYJ101	RES,M 100-J-1/10
R8172	ERJ6GEYJ101	RES,M 100-J-1/10
R8173	ERJ6GEYJ680	RES,M 68-J-1/10
R8174	ERJ6GEYJ680	RES,M 68-J-1/10
R8175	ERJ6GEYJ680	RES,M 68-J-1/10
R8176	ERJ6GEYJ680	RES,M 68-J-1/10
R8177	ERJ6GEYJ680	RES,M 68-J-1/10
R8178	ERJ6GEYJ101	RES,M 100-J-1/10
R8179	ERJ6GEYJ101	RES,M 100-J-1/10
R8180	ERJ6GEYJ470	RES,M 47-J-1/10
R8181	ERJ6GEYJ471	RES,M 470-J-1/10
R8182	ERJ6GEYJ471	RES,M 470-J-1/10
R8183	ERJ6GEYJ471	RES,M 470-J-1/10
R8184	ERJ6GEYJ101	RES,M 100-J-1/10
R8186	ERJ6GEYJ471	RES,M 470-J-1/10

REF NO.	PART NO.	DESCRIPTION
R8190	ERJ6GEYJ101	RES,M 100-J-1/10
R8191	ERJ6GEYJ101	RES,M 100-J-1/10
R8192	ERJ6GEYJ101	RES,M 100-J-1/10
R8193	ERJ6GEYJ102	RES,M 1K-J-1/10
R8194	ERJ6GEYJ102	RES,M 1K-J-1/10
R8195	ERJ6GEYJ102	RES,M 1K-J-1/10
		SWITCHES
S010	EVQPF106K	SWITCH
S011	EVQPF106K	SWITCH
S012	EVQPF106K	SWITCH
S013	EVQPF106K	SWITCH
S014	EVQPF106K	SWITCH
S015	EVQPF106K	SWITCH
S016	EVQPF106K	SWITCH
		TRANSFORMERS
T002	**ETP41KDN215U**	**TRANSFORMER, POWER**
T501	TLHA003	COIL
T551	**KFT5AA163F**	**TRANSFORMER, FLYBACK**
T802	**ETS45FA195AC**	**TRANSFORMER**
T1701	**ETS28AD2B9AC**	**TRANSFORMER, SWITCHING**
		CRYSTALS/FILTERS
X001	TSSA096	CRYSTAL
X101	M1972M	FILTER
X102	EFCWS4504AB	FILTER 4.5MHZ
X201	SFSH4R5MDB	CRYSTAL
X501	TAFCSB503F38	CRYSTAL, CLOCK
X601	TSS816MX	CRYSTAL 3.58MHZ OSCILLATOR
X1551	TAFCSB503F38	CRYSTAL, CLOCK
X1801	TSSA050	CRYSTAL OSCILLATOR
X2102	EFCWS4504AB	FILTER 4.5MHZ
X2103	EFCKM1958M	CERAMIC FILTER
		CRYSTALS/FILTERS
M001	ENPE623	2RF SPLITTER
TNR001	**ENV56D36G3**	**TUNER**
TNR2101	**ENV56D36G3**	**TUNER**
M002	ETCMBGC49-8	FASTENING BAND
M003	ETC35C65NJ	YOKE, CONVERGENCE
RM001	RPM-637CBRS1	IR RECEIVER, REMOTE CONTROL
M004	EUR511155	TRANSMITTER, REMOTE CONTROL
M005	UR51EC892A	BATTERY COVER, REMOTE CONTROL
DY	**KDY4VH845F**	**DEFLECTION YOKE**
M006	**M80LNL161X**	**CRT**
M007	TAS2AA0008	SPEAKER
M008	TAS2AA0009	SPEAKER SUB WOOFER
M009	TBM2AA0021	PANASONIC BADGE
M010	TBM2AX0041	OVERLAY
M011	TBX2AA1401G	7 KEY BUTTON
M012	TEK6935	DOOR, CATCH
M013	TJS2AX00401	PUSH TERMINAL, SPEAKER
M014	TKF2AE00101	WOOFER BOX (FRONT)
M015	TKF2AE00201	WOOFER BOX (COVER)

REPLACEMENT PARTS LIST

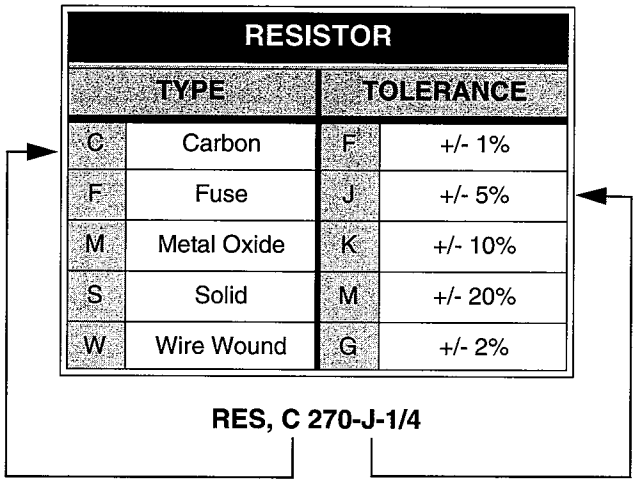
Models: CT-32XF56A & CT-32XF56CA

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO	PART NO	DESCRIPTION
M016	TMM2A30702	WEDGE, YOKE
M017	TQB2AA0319	MANUAL, OWNERS
M018	TQB2AA7032	HOME THEATER GUIDE *CT-32XF56A*
M019	TQB2AA7047	REMOTE GUIDE
M020	TQB2AA7049	V-CHIP ROLLER GUIDE
M021	TQB2A8102	SHEET CAUTION
M022	TSK1018	FERRITTE CORE
DEG	**TSP2AA007**	**COIL, DEGAUSSING 32"**
M023	**TSX2AA0111**	**AC LINE CORD**

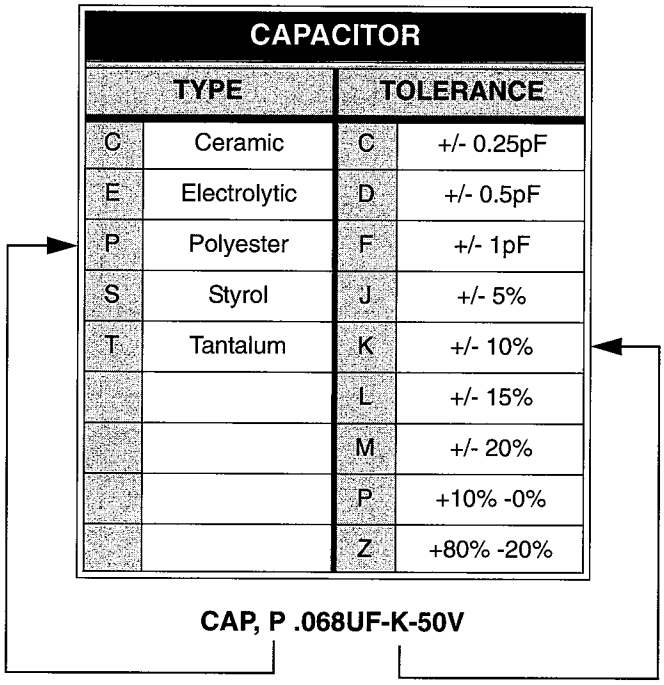
REF NO	PART NO	DESCRIPTION
M024	TXFKU48ASER	ASSY, CABINET BACK *CT-32XF56A*
M025	TXFKU56ASER	ASSY, CABINET BACK *CT-32XF56CA*
M026	TXFKY33ASER	ASSY, CABINET FRONT *CT-32XF56A*
M027	TXFKY39ASER	ASSY, CABINET FRONT *CT-32XF56CA*
M028	TXFYA010DAR	ASSY, DAG GND
M029	0FMK014ZZ	CONVERGENCE CORRECTOR STRIP
JK3002	TJB2AA0111-1	TERMINAL, REAR A/V
JK3004	TJB2AA0131	TERMINAL, FRONT A/V

DESCRIPTION OF ABBREVIATIONS GUIDE



RESISTOR			
TYPE		TOLERANCE	
C	Carbon	F	+/- 1%
F	Fuse	J	+/- 5%
M	Metal Oxide	K	+/- 10%
S	Solid	M	+/- 20%
W	Wire Wound	G	+/- 2%

RES, C 270-J-1/4



CAPACITOR			
TYPE		TOLERANCE	
C	Ceramic	C	+/- 0.25pF
E	Electrolytic	D	+/- 0.5pF
P	Polyester	F	+/- 1pF
S	Styrol	J	+/- 5%
T	Tantalum	K	+/- 10%
		L	+/- 15%
		M	+/- 20%
		P	+10% -0%
		Z	+80% -20%

CAP, P .068UF-K-50V

SERVICEMAN MODE (ELECTRONIC CONTROL)
SERVICE ADJUSTMENT VALUES

Model _____ **Ser #** _____ **Date:**_____

Note: Record the original settings PRIOR to modifying the registers

Mode	Service Adjustment	Adjustment Range	Def Val.	Original Value	New Value
Sub Adjustments					
B 00	Sub Color (NTSC)	0 ~ 63	28		
B 01	Sub Tint (NTSC)	0 ~ 63	51		
B 02	Sub Bright (NTSC)	0 ~ 192	80		
B 03	Sub Contrast (NTSC)	0 ~ 63	43		
B 04	Sub Sharp (NTSC)	0 ~ 128	50		
B 05	Sub Color (525I)	0 ~ 63	48		
B 06	Sub Tint (525I)	0 ~ 63	45		
B 07	Sub Bright (525I)	0 ~ 192	95		
B 08	Sub Contrast (525I)	0 ~ 63	29		
B 09	Sub Sharp (525I)	0 ~ 128	70		
B 0A	RF AGC	0 ~ 255	132		
B 0B	Sub Bright for AI	0 ~ 192	84		
B 0C	Sub Color for AI	0 ~ 15	5		
B 0D	Sub Tint (Video)	0 ~ 15	0		
B 0E	Sub Color (525P)	0 ~ 63	33		
B 0F	Sub Tint (525P)	0 ~ 63	45		
B 10	Sub Bright (525P)	0 ~ 192	110		
B 11	Sub Contrast (525P)	0 ~ 63	33		
B 12	Sub Sharp (525P)	0 ~ 128	90		
Cut-Off Adjustments					
C 00	R Cutoff (NTSC)	**	2 25		
C 01	G Cutoff (NTSC)	0 ~ 255	140		
C 02	B Cutoff (NTSC)	**	2 105		
C 03	Brightness (NTSC)	0 ~ 63	32		
C 04	Sub Bright (NTSC)	0 ~ 192	80		
C 05	Red Drive	0 ~ 127	95		
C 06	Blue Drive	0 ~ 127	90		
C 07	R Drive Correct(COO)	0 ~ 63	32		
C 08	B Drive Correct(COO)	0 ~ 63	32		
C 09	R Drive Correct(WAR)	0 ~ 63	32		
C 0A	B Drive Correct(WAR)	0 ~ 63	32		

Mode	Service Adjustment	Adjustment Range	Def Val.	Original Value	New Value
C 0B	R Cutoff (525I)	**	2 96		
C 0C	G Cutoff (525I)	0 ~ 255	140		
C 0D	B Cutoff (525I)	**	2 123		
C 0E	R Cutoff (525P)	**	2 74		
C 0F	G Cutoff (525P)	0 ~ 255	140		
C 10	B Cutoff (525P)	**	2 120		
Pincushion Adjustments					
D 00	V Amplitude (Norm)	0 ~ 127	100		
D 01	V Position (Norm)	0 ~ 255	100		
D 02	V Linearity (Norm)	0 ~ 63	32		
D 03	V S Correction (Norm)	0 ~ 63	32		
D 04	Trapezoid (Norm)	0 ~ 63	17		
D 05	EW DC (Norm)	0 ~ 63	32		
D 06	EW Amplitude (Norm)	0 ~ 63	24		
D 07	EWCorner btm (Norm)	0 ~ 15	7		
D 08	EWCorner top (Norm)	0 ~ 15	0		
D 09	H Position (Norm)	0 ~ 31	17		
D 0A	Sidepin (Norm)	0 ~ 15	5		
D 0B	Parallel (Norm)	0 ~ 15	9		
D 0C	V EHT (Norm)	0 ~ 7	3		
D 0D	H EHT (Norm)	0 ~ 7	2		
D 0E	EHT AC gain (Norm)	0 ~ 7	5		
D 0F	DAC Mode (Norm)	0 ~ 1	0		
D 10	Moire (Norm)	0 ~255	0		
D 11	AFC1 gain (Norm)	0 ~ 3	0		
D 12	H DAF Pos (Norm)	0 ~ 255	186		
D 13	H DAF gain (Norm)	0 ~ 255	97		
D 14	V DAF gain (Norm)	0 ~ 255	66		
D 15	V DAF Pos (Norm)	0 ~ 255	157		
D 16	V Amplitude (Wide)	0 ~ 127	49		
D 17	V Position (Wide)	0 ~ 255	113		
D 18	V Linearity (Wide)	0 ~ 63	19		
D 19	V S Correction (Wide)	0 ~ 63	14		

**Adjustment indicated in steps:

0 00 ~ 0 255
1 00 ~ 1 255
2 00 ~ 2 255
3 00 ~ 3 255

Note: *Some adjustments modes may not be available in some models depending on available options.*

SERVICEMAN MODE (ELECTRONIC CONTROL)
SERVICE ADJUSTMENT VALUES

Model _____ **Ser #** _____ **Date:**_____

Note: Record the original settings PRIOR to modifying the registers

Mode	Service Adjustment	Adjustment Range	Def Val.	Original Value	New Value
Pincushion Adjustments (cont)					
D 1A	Trapezoid (Wide)	0 ~ 63	25		
D 1B	EW DC (Wide)	0 ~ 63	32		
D 1C	EW Amplitude (Wide)	0 ~ 63	32		
D 1D	EWCorner btm (Wide)	0 ~ 15	8		
D 1E	EWCorner top (Wide)	0 ~ 15	7		
D 1F	H Position (Wide)	0 ~ 31	18		
D 20	Sidepin (Wide)	0 ~ 15	6		
D 21	Parallel (Wide)	0 ~ 15	8		
D 22	V EHT (Wide)	0 ~ 7	1		
D 23	H EHT (Wide)	0 ~ 7	2		
D 24	EHT AC gain (Wide)	0 ~ 7	7		
D 25	DAC Mode (Wide)	0 ~ 1	0		
D 26	Moire (Wide)	0 ~ 255	0		
D 27	AFC1 gain (Wide)	0 ~ 3	1		
D 28	H DAF Pos (Wide)	0 ~ 255	125		
D 29	H DAF gain (Wide)	0 ~ 255	97		
D 2A	V DAF gain (Wide)	0 ~ 255	97		
D 2B	V DAF Pos(Wide)	0 ~ 255	127		
PIP Adjustments					
P 00	PIP Color	0 ~ 127	63		
P 01	PIP Tint	0 ~ 255	54		
P 02	PIP Brightness	0 ~ 31	15		
P 03	PIP Contrast	0 ~ 127	66		
P 04	V Position 9 Up	0 ~ 255	120		
P 05	V Position 9 Down	0 ~ 255	122		
P 06	H Position 9 Left	0 ~ 255	32		
P 07	H Position 9 Right	0 ~ 255	7		
P 08	V Position 16 Up	0 ~ 255	7		
P 09	V Position 16 Down	0 ~ 255	8		
P 0A	H Position 16 Left	0 ~ 255	8		
P 0B	H Position 16 Right	0 ~ 255	32		
P 0C	PIP Freerun	0 ~ 0	0		
P 0D	PIP Y Delay	0 ~ 15	7		
Options Adjustments					
S 00	MTS Input Level	0 ~ 63	45		
S 01	MTS PLL VCO	0 ~ 63	36		
S 02	MTS Filter	0 ~ 63	35		

Mode	Service Adjustment	Adjustment Range	Def Val.	Original Value	New Value
S 03	MTS Low Separation	0 ~ 63	43		
S 04	MTS High Separation	0 ~ 63	24		
S 05	Loudness Comp	0 ~ 15	7		
S 06	Spatializer	0 ~ 63	32		
S 07	Bass Mix	0 ~ 3	1		
S 08	Clock Adjust	0 ~ 255	128		
S 09	CC Digital Filter SW	0 ~ 1	1		
S 0A	CC Scroll	0 ~ 2	2		
S 0B	CIP Contrast (NTSC)	0 ~ 127	57		
S 0C	CIP Bright (NTSC)	0 ~ 127	32		
S 0D	CIP UBVR clamp (NTSC)	0 ~ 127	64		
S 0E	CIP Blk level (NTSC)	0 ~ 127	43		
S 0F	CIP U gain (NTSC)	0 ~ 127	64		
S 10	CIP V gain (NTSC)	0 ~ 127	66		
S 11	CIP Contrast (DTV)	0 ~ 127	64		
S 12	CIP Bright (DTV)	0 ~ 127	32		
S 13	CIP UBVR clamp (DTV)	0 ~ 127	63		
S 14	CIP Blk level (DTV)	0 ~ 127	63		
S 15	CIP U gain (DTV)	0 ~ 127	63		
S 16	CIP V gain (DTV)	0 ~ 127	63		
S 17	VM Amp gain (NTSC)	0 ~ 255	148		
S 18	VM Limit gain (NTSC)	0 ~ 255	127		
S 19	DSC large gain (NTSC)	0 ~ 255	127		
S 1A	DSC small gain (NTSC)	0 ~ 255	127		
S 1B	Undefined (N/A)	0 ~ 255	127		
S 1C	Undefined (N/A)	0 ~ 255	128		
S 1D	Undefined (N/A)	0 ~ 255	127		
S 1E	VM Amp gain (DTV)	0 ~ 255	127		
S 1F	VM Limit gain (DTV)	0 ~ 255	127		
S 20	DSC large gain (DTV)	0 ~ 255	127		
S 21	DSC small gain (DTV)	0 ~ 255	128		
S 22	Undefined (N/A)	0 ~ 255	127		
S 23	Undefined (N/A)	0 ~ 255	127		
S 24	Undefined (N/A)	0 ~ 255	127		

Note: *Some adjustments modes may not be available in some models depending on available options.*

SERVICEMAN MODE (ELECTRONIC CONTROL)
SERVICE ADJUSTMENT VALUES

Model _____ **Ser #** _____ **Date:**_____

Note: Record the original settings PRIOR to modifying the registers

Mode	Service Adjustment	Adjustment Range	Def Val.	Original Value	New Value
Options Adjustments (cont)					
S 25	VCJ Color	0 ~ 127	63		
S 26	VCJ Tint	0 ~ 127	63		
S 27	VCJ Bright	0 ~ 255	128		
S 28	VCJ Contrast	0 ~ 127	65		
S 29	VCJ R Drive	0 ~ 255	128		
S 2A	VCJ B Drive	0 ~ 255	127		
S 2B	VCJ R-Y axis angle	0 ~ 31	15		
S 2C	VCJ R-Y axis gain	0 ~ 63	48		
S 2D	VCJ H Center	0 ~ 31	15		
S 2E	Undefined (N/A)	0 ~ 28	14		
S 2F	Undefined (N/A)	0 ~ 28	14		
S 30	ACL gain	0 ~ 15	7		
S 31	ACL start (NTSC)	0 ~ 4	2		
S 32	Blk Gradient gain	0 ~ 15	7		
S 33	Blk Gradient start	0 ~ 15	8		
S 34	Wht Grad gain (NTSC)	0 ~ 15	7		
S 35	Wht Grad start (NTSC)	0 ~ 15	7		
S 36	Wht Character gain	0 ~ 15	7		
S 37	Wht Character start	0 ~ 15	7		
S 38	B-Y axis gain (NTSC)	0 ~ 63	35		
S 39	B-Y axis gain (525I)	0 ~ 63	32		
S 3A	R-Y axis angle	0 ~ 7	6		
S 3B	G-Y Matrix SW	0 ~ 3	1		
S 3C	ACL SW	0 ~ 1	0		
S 3D	Wht Gradient SW	0 ~ 1	0		
S 3E	Blk Gradient SW	0 ~ 1	0		
S 3F	B-Y axis gain (525P)	0 ~ 63	32		
S 40	Blanking SW	0 ~ 1	0		

Mode	Service Adjustment	Adjustment Range	Def Val.	Original Value	New Value
S 41	Forced 525P SW	0 ~ 1	0		
S 42	Weak Field Comp	0 ~ 255	127		
S 43	VM Comp	0 ~ 255	127		
S 44	Sharpness Comp	0 ~ 255	127		
S 45	YG clamp level	0 ~ 127	40		
S 46	Y offset level	0 ~ 255	127		
S 47	ACL start (525P)	0 ~ 15	7		
S 48	Wht Grad gain (525P)	0 ~ 15	7		
S 49	Wht Grad start (525P)	0 ~ 15	8		
S 4A	ACL start (Wide)	0 ~ 15	7		
S 4B	Wht Grad gain (Wide)	0 ~ 15	7		
S 4C	Wht Grad start (Wide)	0 ~ 15	8		
S 4D	Blanking Pos Correct	0 ~ 22	0		
S 4E	Semi-TRA offset (Normal)	0 ~ 63	32		
S 4F	Semi-TRA offset (Wide)	0 ~ 63	32		
S 50	H-sync/nosync 525I	1 ~ 270	251		
S 51	H-sync 525I(nonstd)	305 ~ 414	324		
S 52	H-sync 525P(nonstd)	415 ~ 524	505		
S 53	H-sync 525P-1125I	590 ~ 631	610		
S 54	DC-rest correction	0 ~ 1	1		
W Options Adjustments					
W 00	SVP Tmp factor	0 ~ 3	3		
W 01	SVP Hec level	0 ~ 7	3		
W 02	SVP Vec level	0 ~ 7	3		
W 03	SVP Hec coring gain	0 ~ 7	4		
W 04	SVP Vec coring gain	0 ~ 7	4		
W 05	SVP Motion DET level	0 ~ 7	4		
W 06	SVP Y level	0 ~ 31	16		
W 07	SVP H/V Shade gain	0 ~ 15	7		
W 08	SVP H/V Shade coring	0 ~ 7	4		

Note: *Some adjustments modes may not be available in some models depending on available options.*

SERVICEMAN MODE (ELECTRONIC CONTROL)
SERVICE ADJUSTMENT VALUES

Model _____ **Ser #** _____ **Date:**_____

Note: Record the original settings PRIOR to modifying the registers

Mode	Service Adjustment	Adjustment Range	Def Val.	Original Value	New Value
Y Options Adjustments					
Y 00	Sync Separation	0 ~ 7	4		
Y 01	Sync Separation	0 ~ 255	122		
Y 02	Sync Separation	0 ~ 255	122		
Y 03	Sync Separation	0 ~ 255	122		
Y 04	V Comp Hold(start)	0 ~ 7	3		
Y 05	V Comp Hold(end)	0 ~ 15	7		
Y 06	H Clamp Mode Level	0 ~ 255	122		
Y 07	V Edge Coring Level	0 ~ 31	16		
Y 08	V Edge Corr Limit Lev	0 ~ 15	7		
Y 09	3D NStand Level	0 ~ 15	8		
Y 0A	3D Stand Level	0 ~ 15	8		
Y 0B	1F2F Mdet High level	0 ~ 15	7		
Y 0C	1F2F Mdet Low level	0 ~ 15	7		
Y 0D	Mdet Set	0 ~ 15	7		
Y 0E	Mdet Test	0 ~ 1	0		
Y 0F	V Edge Gain	0 ~ 3	1		
Y 10	1F Color MLevel Set	0 ~ 15	8		
Y 11	1F Color MLevel Set	0 ~ 15	7		
Y 12	Mdet Set	0 ~ 15	7		
Y 13	Color MEdge Det Lev	0 ~ 15	7		
Y 14	1F Mdet level	0 ~ 15	7		
Y 15	2F Mdet level	0 ~ 15	7		
Y 16	1F Mdet Filter SW	0 ~ 1	0		
Y 17	1F Mdet Edge Sens	0 ~ 1	1		
Y 18	1F Mdet Sens	0 ~ 15	8		
Y 19	1F Mdet High level	0 ~ 15	7		
Y 1A	1F Mdet Low level	0 ~ 15	7		
Y 1B	2F Mdet High level	0 ~ 15	8		
Y 1C	2F Mdet Low level	0 ~ 15	7		
Y 1D	Mdet Edge Det Level	0 ~ 15	7		
Y 1E	AI V Sampling (start)	0 ~ 31	15		
Y 1F	AI V Sampling (stop)	0 ~ 63	32		

Mode	Service Adjustment	Adjustment Range	Def Val.	Original Value	New Value
Y 20	AI H Sampling (start)	0 ~ 31	15		
Y 21	AI H Sampling (stop)	0 ~ 63	32		
Y 22	BGP Position	0 ~ 255	122		
Y 23	B Exp APL Thresh L	0 ~ 63	32		
Y 24	Pedestal Comp	0 ~ 7	3		
Y 25	B Exp APL Calc	0 ~ 31	15		
Y 26	B Comp Var Limiter	0 ~ 15	7		
Y 27	Luminance Diff Gain	0 ~ 3	1		
Y 28	Psuedo Contour Killer	0 ~ 1	0		
Y 29	B Exp APL Reflection	0 ~ 1	0		
Y 2A	Base Value	0 ~ 15	7		
Y 2B	B Exp Var Reflection	0 ~ 3	2		
Y 2C	AntiBloom Threshold	0 ~ 63	32		
Y 2D	S1 Histogram Limiter	0 ~ 63	32		
Y 2E	S2 Histogram Limiter	0 ~ 63	32		
Y 2F	S3 Histogram Limiter	0 ~ 63	32		
Y 30	S4 Histogram Limiter	0 ~ 63	32		
Y 31	Ymin Det Offset	0 ~ 7	3		
Y 32	Ymin Det Gain	0 ~ 3	2		
Y 33	Ymin Limiter	0 ~ 63	32		
Y 34	Ymax Limit Value	0 ~ 63	32		
Y 35	AI Fleshtone SW	0 ~ 1	1		
Y 36	APL Corr Limiter	0 ~ 63	32		
Y 37	APL Corr SW point	0 ~ 127	62		
Y 38	Col Cont Level(L APL)	0 ~ 63	32		
Y 39	Col Cont Gain(L APL)	0 ~ 3	1		
Y 3A	Col Cont Gain(H APL)	0 ~ 63	32		
Y 3B	AI Col Corr Gain	0 ~ 3	1		
Y 3C	Color Det Gain	0 ~ 3	1		
Y 3D	Color Det Threshold	0 ~ 63	32		
Y 3E	DSC Noise Removal	0 ~ 63	32		
Y 3F	DSC Delay SW	0 ~ 1	0		
Y 40	DSC Off SW	0 ~ 1	1		

Note: *Some adjustments modes may not be available in some models depending on available options.*

SERVICEMAN MODE (ELECTRONIC CONTROL)
SERVICE ADJUSTMENT VALUES

Model _____ **Ser #** _____ **Date:**_____

Note: Record the original settings PRIOR to modifying the registers

Mode	Service Adjustment	Adjustment Range	Def. Val.	Original Value	New Value
Y Options Adjustments (cont.)					
Y 41	DSC Limit Level	0 ~ 255	112		
Y 42	Clip point Edge Corr	0 ~ 15	8		
Y 43	BPF SW (RF)	0 ~ 3	2		
Y 44	BPF SW (Video)	0 ~ 3	1		
Y 45	DSC Gain SW(big sig)	0 ~ 3	1		
Y 46	DSC Limit SW(big sig)	0 ~ 63	32		
Y 47	DSC Gain SW(sm sig)	0 ~ 3	1		
Y 48	DSC Limit SW(sm sig)	0 ~ 63	32		
Y 49	Edge Corr Gain SW	0 ~ 15	8		
Y 4A	Detail corr Limit Lev	0 ~ 15	8		
Y 4B	B corr Gain on Edge	0 ~ 3	1		
Y 4C	Coring Level on Edge	0 ~ 63	32		
Y 4D	VM Freq SW	0 ~ 1	1		
Y 4E	VM Coring Level	0 ~ 15	8		
Y 4F	VM Limit Level	0 ~ 127	62		
Y 50	VM B corr SW	0 ~ 1	0		
Y 51	Y Delay Adj	0 ~ 7	3		
Y 52	C Delay Adj(RF)	0 ~ 15	8		

Mode	Service Adjustment	Adjustment Range	Def. Val.	Original Value	New Value
Y 53	C Delay Adj(Video)	0 ~ 15	8		
Y 54	DCOR corr COEFFI A	0 ~ 255	122		
Y 55	DCOR corr COEFFI B	0 ~ 255	122		
Y 56	DCOR corr COEFFI C	0 ~ 255	122		
Y 57	VMLM corr COEFFI A	0 ~ 255	122		
Y 58	VMLM corr COEFFI B	0 ~ 255	122		
Y 59	Sharp Offset Level	0 ~ 127	62		
Y 5A	WECOR Thresh(s sig)	0 ~ 255	122		
Y 5B	WECOR Thresh(w sig)	0 ~ 255	122		
Y 5C	Burst in (16msXn)	0 ~ 255	122		
Y 5D	Burst out (16msXn)	0 ~ 255	122		
Y 5E	SD Treshold(on)	0 ~ 255	122		
Y 5F	SD Treshold(off)	0 ~ 255	122		
Y 60	VP Treshold max	0 ~ 255	122		
Y 61	VP Treshold min	0 ~ 255	122		
Y 62	VP (NG→OK) 16msXn	0 ~ 255	122		
Y 63	VP (OK→NG) 16msXn	0 ~ 255	122		
Y 64	Std time (16msXn)	0 ~ 255	122		
Y 65	SD (NG→OK) 16msXn	0 ~ 255	122		
Y 66	SD (OK→NG) 16msXn	0 ~ 255	122		
Y 67	Freq Avg Quantity	0 ~ 4	2		

Note: *Some adjustments modes may not be available in some models depending on available options.*

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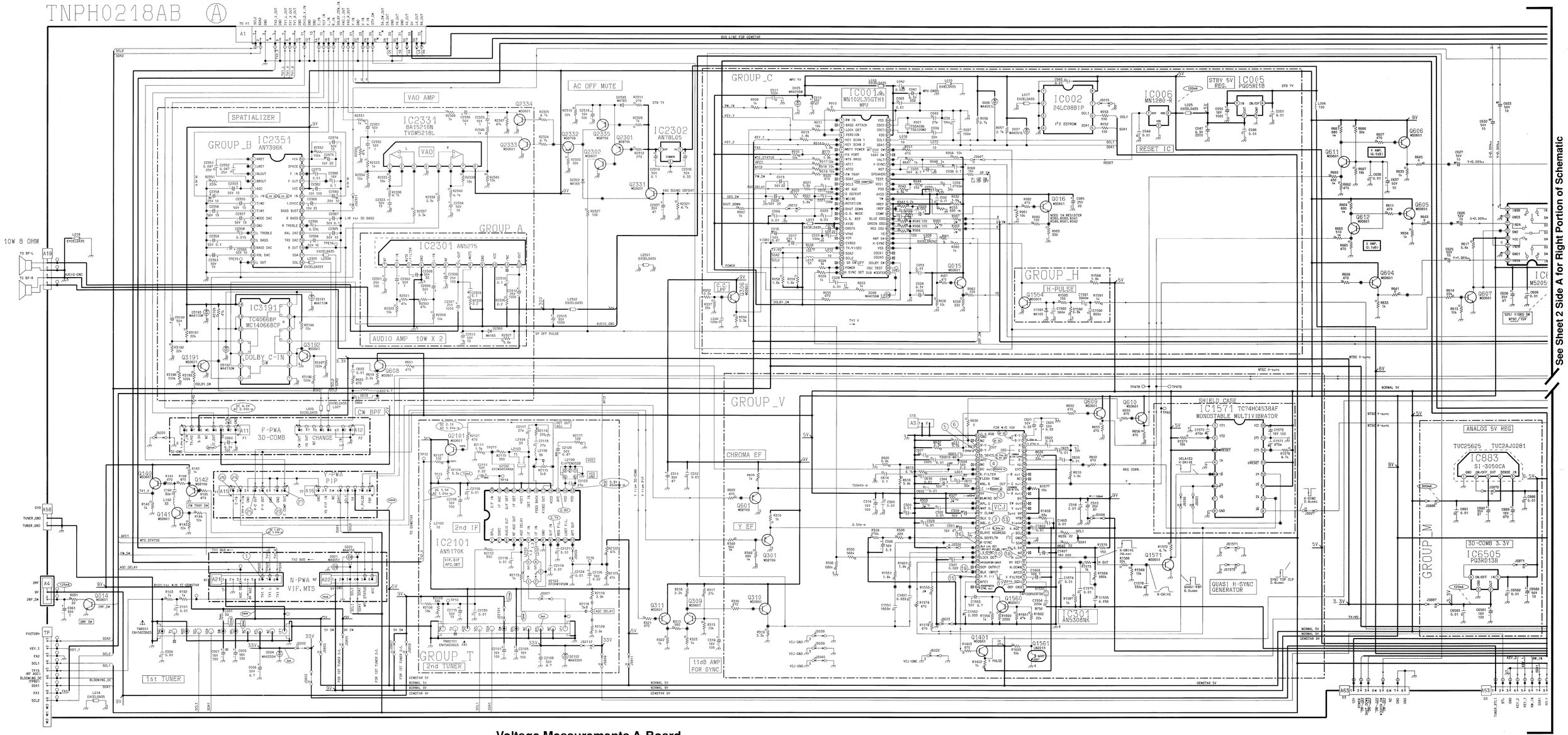
V99062600ME0802

A-Board Schematic (See Sheet 2 Side A for Right Portion of Schematic)



Voltage Measurements A-Board

IC001			
1	4.87	33	0.00
2	n.c	34	0.00
3	3.09	35	4.90
4	0.00	36	n.c
5	4.92	37	n.c
6	2.79	38	GND
7	n.c	39	4.48
8	4.93	40	3.88
9	1.28	41	0.00
10	3.10	42	0.00
11	2.99	43	0.00
12	0.00	44	0.00
13	n.c	45	3.37
14	n.c	46	1.46
15	2.41	47	1.46
16	0.00	48	0.00
17	0.00	49	4.93
18	n.c	50	1.10
19	0.33	51	1.10
20	n.c	52	4.93
21	n.c	53	4.92
22	4.93	54	4.93
23	0.11	55	4.01
24	2.87	56	4.93
25	n.c	57	n.c
26	2.54	58	4.86
27	0.00	59	4.30
28	2.55	60	4.25
29	2.55	61	4.93
30	n.c	62	2.42
31	4.72	63	2.48
32	0.05	64	GND

IC002	
1	GND
2	GND
3	GND
4	GND
5	4.30
6	4.30
7	GND
8	4.94

IC005	
1	7.18
2	4.94
3	GND
4	0.19

IC006	
1	4.93
2	4.93
3	GND

IC301			
1	GND	33	GND
2	2.17	34	n.c
3	1.64	35	2.77
4	3.06	36	2.73
5	0.00	37	2.72
6	5.66	38	2.54
7	1.22	39	n.c
8	n.c	40	3.17
9	6.27	41	4.74
10	4.30	42	3.37
11	GND	43	3.17
12	4.30	44	2.70
13	3.75	45	4.96
14	0.65	46	0.00
15	0.40	47	0.00
16	8.97	48	3.29
17	n.c	49	5.41
18	n.c	50	4.96
19	8.97	51	2.98
20	n.c	52	3.61
21	5.59	53	GND
22	3.34	54	2.70
23	n.c	55	2.51
24	n.c	56	0.00
25	GND	57	2.47
26	0.16	58	5.79
27	2.87	59	0.16
28	0.40	60	0.54
29	2.57	61	0.53
30	2.84	62	4.09
31	4.01	63	4.18
32	4.01	64	n.c

IC601	
1	4.62
2	0.00
3	3.16
4	GND
5	3.16
6	3.15
7	0.00
8	4.61
9	4.61
10	GND
11	4.61
12	0.00
13	8.97
14	4.62
15	GND
16	4.62

IC881	
1	GND
2	11.88
3	9.04
4	9.04
5	11.87

IC882	
1	GND
2	14.02
3	9.07
4	9.06
5	14.02

IC883	
1	GND
2	6.71
3	5.01
4	5.01
5	6.71

IC884	
1	0.00
2	6.70
3	4.95
4	4.95
5	6.70

IC885	
1	4.94
2	3.35
3	GND
4	4.94

IC1551	
1	0.05
2	3.47
3	0.05
4	4.80
5	4.80
6	GND
7	GND
8	GND
9	0.03
10	0.03
11	n.c
12	n.c
13	n.c
14	n.c
15	3.45
16	8.96

IC1552	
1	0.05
2	3.44
3	0.05
4	4.80
5	4.80
6	GND
7	GND
8	GND
9	0.06
10	0.06
11	0.00
12	0.05
13	0.05
14	0.00
15	3.45
16	8.96

IC1553	
1	n.c
2	n.c
3	4.05
4	4.04
5	GND
6	6.23
7	6.18
8	6.25
9	6.12
10	1.78
11	0.16
12	GND
13	0.05
14	4.90
15	0.05
16	11.90
17	0.05
18	n.c
19	n.c
20	3.43

IC1571	
1	GND
2	4.47
3	4.96
4	GND
5	3.21
6	0.53
7	5.44
8	GND
9	4.80
10	0.16
11	n.c
12	0.53
13	4.97
14	4.82
15	GND
16	4.97

IC2101	
1	n.c
2	n.c
3	n.c
4	2.72
5	2.33
6	2.58
7	2.58
8	GND
9	2.57
10	1.20
11	2.61
12	2.97
13	3.53
14	3.53
15	2.72
16	4.86
17	2.03
18	2.03
19	1.92
20	4.86
21	1.92
22	n.c
23	2.32
24	n.c

IC2301	
1	1.11
2	0.00
3	32.70
4	GND
5	0.00
6	1.11
7	15.50
8	4.91
9	GND
10	33.30
11	n.c
12	15.40

IC2302	
1	7.09
2	5.05
3	GND

IC2331	
1	4.48
2	4.48
3	4.48
4	GND
5	4.48
6	4.48
7	4.48
8	8.96

IC2351	
1	4.50
2	4.50
3	4.48
4	4.41
5	1.46
6	4.48
7	0.63
8	0.81
9	0.79
10	GND
11	4.48
12	4.50
13	1.65
14	3.90
15	4.48
16	2.60
17	2.60
18	4.48
19	1.67
20	2.52
21	4.49
22	4.50
23	4.50
24	4.49
25	4.48
26	8.96
27	4.49
28	4.47
29	1.68
30	1.69

IC2452	
1	4.50
2	4.49
3	4.49
4	8.99
5	4.49
6	4.50
7	4.50
8	n.c
9	n.c
10	n.c
11	GND
12	n.c
13	n.c
14	n.c

IC3191	
1	4.46
2	4.47
3	4.49
4	4.48
5	8.95
6	8.96
7	GND
8	4.48
9	4.47
10	4.47
11	4.46
12	0.00
13	0.00
14	8.97

IC6505	
1	6.71
2	3.32
3	3.32
4	6.71

	Q014	Q015	Q016	Q140	Q141	Q142	Q301	Q306
B	0.79	0.00	0.01	2.14	0.01	1.46	0.89	5.42
C	0.05	4.93	4.93	8.95	0.00	GND	GND	9.02
E	GND	0.00	0.00	1.52	GND	2.15	1.56	4.79

	Q309	Q310	Q311	Q401	Q601	Q604	Q605	Q606
B	2.34	6.36	2.70	5.78	1.22	3.36	5.14	5.13
C	6.37	8.98	8.98	7.71	GND	8.97	8.97	8.97
E	1.73	5.74	2.07	5.11	1.89	2.74	4.55	4.50

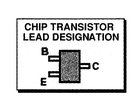
	Q607	Q608	Q609	Q610	Q611	Q612	Q1401	Q1552
B	0.65	3.17	2.73	2.77	3.02	3.02	4.07	0.65
C	0.03	4.89	8.97	8.97	5.14	5.15	4.96	0.06
E	GND	2.55	2.10	2.15	2.39	2.38	3.44	GND

	Q1554	Q1555	Q1560	Q1561	Q1571	Q2101	Q2301	Q2302
B	-0.22	6.20	0.69	0.00	0.28	2.03	5.05	0.00
C	4.49	11.92	0.08	3.64	3.22	4.86	0.00	4.91
E	GND	5.55	0.08	GND	GND	1.43	4.46	GND

	Q2331	Q2332	Q2333	Q2334	Q2335	Q3191	Q3192
B	0.02	0.00	0.00	0.00	5.05	0.60	0.01
C	5.06	0.00	0.00	0.00	0.00	0.00	8.96
E	0.00	0.00	GND	GND	4.46	GND	GND

Overlapping Portion of Schematic

CHIP TRANSISTOR LEAD DESIGNATION



Boards Designation

- A-Board - Main Chassis
- C-Board - CRT Drive
- D-Board - Power Supply
- E-Board - Main Power
- F-Board - 3D Comb Filter
- N-Board - VIF/SIF MTS Decoder
- V-Board - Protection Circuit
- W-Board - VIF/SIF MTS Decoder
- X-Board - I/O Interface
- Y-Board - PIP Controller

Voltage Measurements E-Board

IC1701			
1	GND	16	5.33
2	6.18	17	4.19
3	0.88	18	4.13
4	0.51	19	1.20
5	6.16	20	n.c
6	1.26	21	GND
7	4.34	22	4.30
8	1.30	23	1.89
9	4.94	24	3.63
10	12.01	25	1.26
11	n.c	26	12.01
12	1.30	27	6.32
13	4.13	28	0.18
14	4.21	29	0.16
15	5.11	30	4.17

IC1702	
1	5.99
2	5.99
3	5.99
4	GND
5	5.11
6	5.11
7	5.11
8	12.01

IC801 ⏚	
1	1.04
2	0.45
3	0.21
4	0.08
5	GND
6	5.98
7	15.00
8	0.15
9	5.37

IC2401	
1	0.12
2	n.c
3	0.80
4	GND
5	0.80
6	0.40
7	0.40
8	0.20
9	GND
10	33.30
11	n.c
12	n.c

IC802	
1	140.80
2	n.c
3	GND

IC803	
1	GND
2	14.10
3	12.10
4	12.10
5	14.10

IC811	
1	11.24
2	10.25
3⏚	GND
4⏚	5.86

	Q806	Q807	Q808	Q850	Q851	Q860	Q861
B	-0.08	0.66	8.40	0.61	-0.05	140.50	0.06
C	10.30	0.08	- 0.28	-0.05	10.30	1.25	GND
E	GND	GND	6.80	GND	GND	141.10	0.67

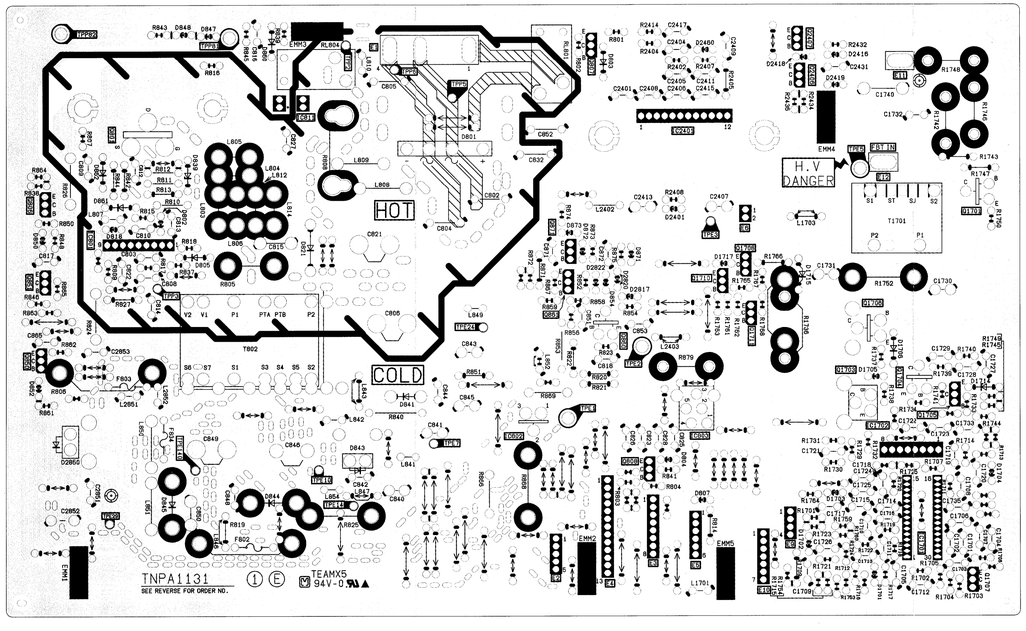
	Q871	Q1701	Q1703	Q1704	Q1705	Q1706	Q1707
B	28.40	3.21	56.70	0.77	5.12	58.40	0.63
C	-0.06	221.60	GND	56.70	0.77	180.00	0.16
E	23.90	2.59	57.10	0.22	5.66	58.10	GND

	Q1708	Q1710	Q1711	Q2406	Q2407
B	0.60	0.59	0.00	7.80	- 1.86
C	0.00	0.00	0.77	- 1.20	0.04
E	GND	GND	GND	7.12	GND

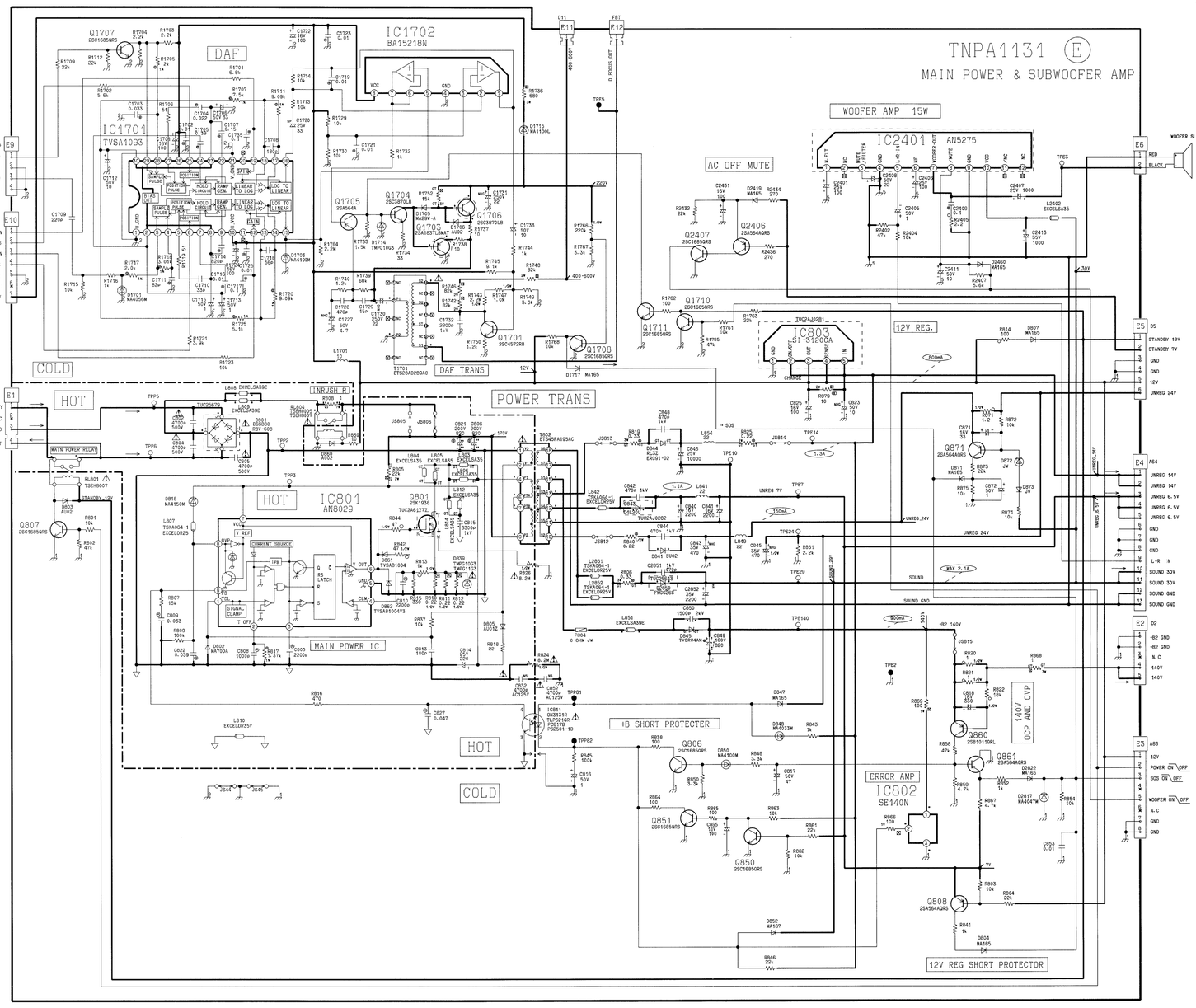
	Q801⏚
S	- 16.80
D	49.20
G	- 14.27

Note:
The board layout has been modified to enhance and display traces otherwise hidden by a mask.

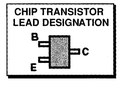
E-Board Layout - TNPA1131



E-Board Schematic



CHIP TRANSISTOR LEAD DESIGNATION



Schematic Notes

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in μH.
4. Test point indicated by ▼: Test point but no pin ⟆.
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION;** ⏦ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

Voltage Measurements

1. Voltage measurement:
   - AC Input to the Receiver is 120V, NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize;
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content. Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter.
   Incorrect ground connection will result in erroneous readings.

*CAUTION: **Incorrect ground connection of the test equipment will result in erroneous readings.***

Boards Designation

- A-Board - Main Chassis
- C-Board - CRT Drive
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- E-Board - Main Power
- F-Board - 3D Comb Filter
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- V-Board - Protection Circuit
- W-Board - VIF/SIF MTS Decoder
- X-Board - I/O Interface
- Y-Board - PIP Controller

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

A | B | C | D | E | F | G | H

1

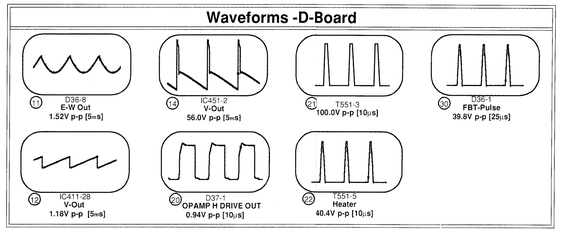
2

3

4

5

Waveforms -D-Board



Voltage Measurements D-Board

IC411			
1	4.34	22	5.91
2	3.34	23	4.97
3	6.48	24	2.43
4	GND	25	n.c
5	6.02	26	n.c
6	5.24	27	GND
7	0.70	28	3.59
8	n.c	29	GND
9	1.51	30	3.72
10	1.51	31	n.c
11	1.87	32	3.87
12	5.08	33	0.84
13	4.30	34	0.01
14	4.30	35	n.c
15	8.99	36	GND
16	2.42	37	6.16
17	0.06	38	1.59
18	4.41	39	2.18
19	GND	40	2.75
20	1.32	41	0.29
21	3.15	42	2.38

IC451	
1	GND
2	13.52
3	26.50
4	2.28
5	2.28
6	26.50
7	1.98

IC506	
R	2.48
A	GND
K	6.48

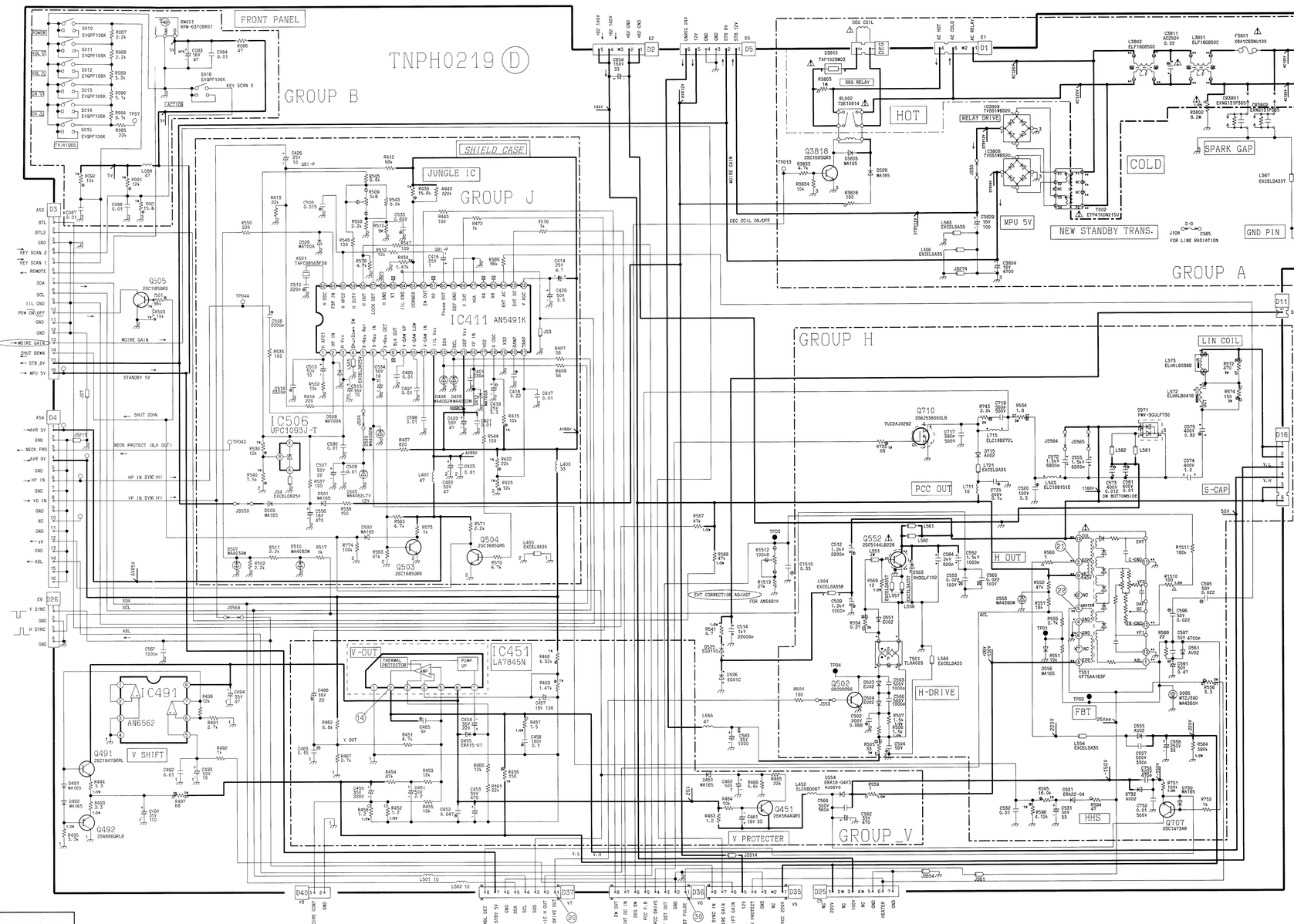
IC491	
1	0.00
2	0.00
3	GND
4	GND
5	1.99
6	2.00
7	10.80
8	26.60

	Q451	Q491	Q492	Q502	Q503
B	24.60	10.90	9.57	0.34	0.70
C	0.20	26.60	GND	19.30	0.00
E	27.00	10.30	10.20	GND	GND

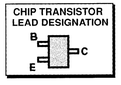
	Q504	Q505	Q552	Q707	Q3818
B	0.03	0.04	0.00	- 19.60	0.09
C	5.01	4.03	139.40	27.10	12.00
E	GND	GND	GND	- 20.10	GND

	Q710
D	23.80
G	9.41
S	GND

D-Board Schematic



CHIP TRANSISTOR LEAD DESIGNATION



Schematic Notes

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in µH.
4. Test point indicated by ●; Test point but no pin ⌇.
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⏚ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

Voltage Measurements

1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter. Incorrect ground connection will result in erroneous readings.

CAUTION: ***Incorrect ground connection of the test equipment will result in erroneous readings.***

Waveform Measurements

1. ③ indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
2. Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
5. Ground symbol ⏚ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

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Boards Designation

- A-Board - Main Chassis
- C-Board - CRT Drive
- D-Board - Power Supply
- E-Board - Main Power
- F-Board - 3D Comb Filter
- N-Board - VIF/SIF MTS Decoder
- V-Board - Protection Circuit
- W-Board - VIF/SIF MTS Decoder
- X-Board - I/O Interface
- Y-Board - PIP Controller

Note:
D-Board Layout on Sheet 5 Side A

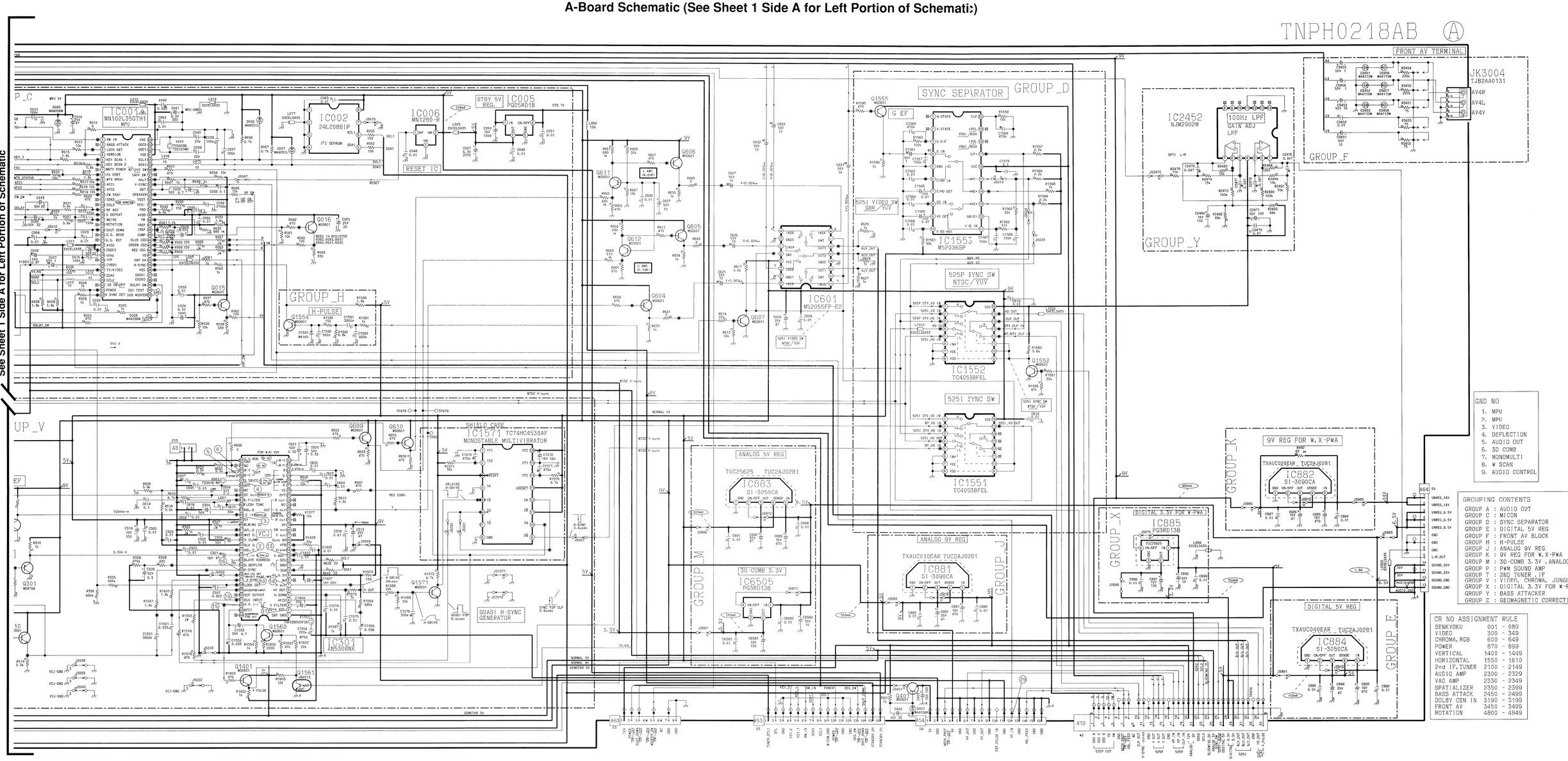
E F G H I J K L

A-Board Schematic (See Sheet 1 Side A for Left Portion of Schematic)

1 2 3 4 5

See Sheet 1 Side A for Left Portion of Schematic

TNPH0218AB (A)



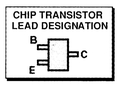
Overlapping Portion of Schematic

Note:
A-Board Layout on Sheet 5 Side B

Boards Designation

- A-Board - Main Chassis
- C-Board - CRT Drive
- D-Board - Power Supply
- E-Board - Main Power
- F-Board - 3D Comb Filter
- N-Board - VIF/SIF MTS Decoder
- V-Board - Protection Circuit
- W-Board - VIF/SIF MTS Decoder
- X-Board - I/O Interface
- Y-Board - PIP Controller

CHIP TRANSISTOR LEAD DESIGNATION



Schematic Notes

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in µH.
4. Test point indicated by ▼ : Test point but no pin ┼.
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⏚ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

Voltage Measurements

1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antennna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter.
   Incorrect ground connection will result in erroneous readings.

*CAUTION: **Incorrect ground connection of the test equipment will result in erroneous readings.***

Waveform Measurements

1. ① indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
2. Taken with an NTSC signal generator connected to the antennna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
5. Ground symbol ⏚ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.

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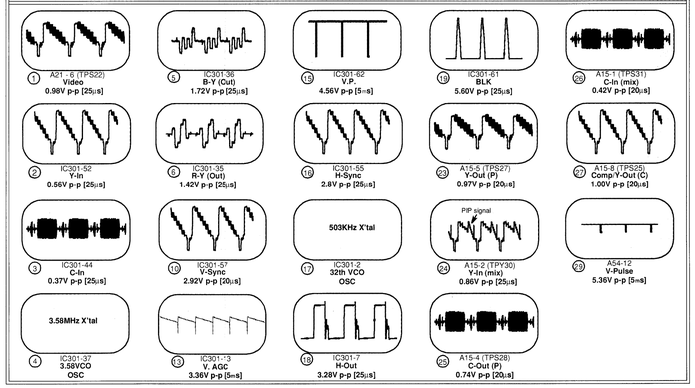
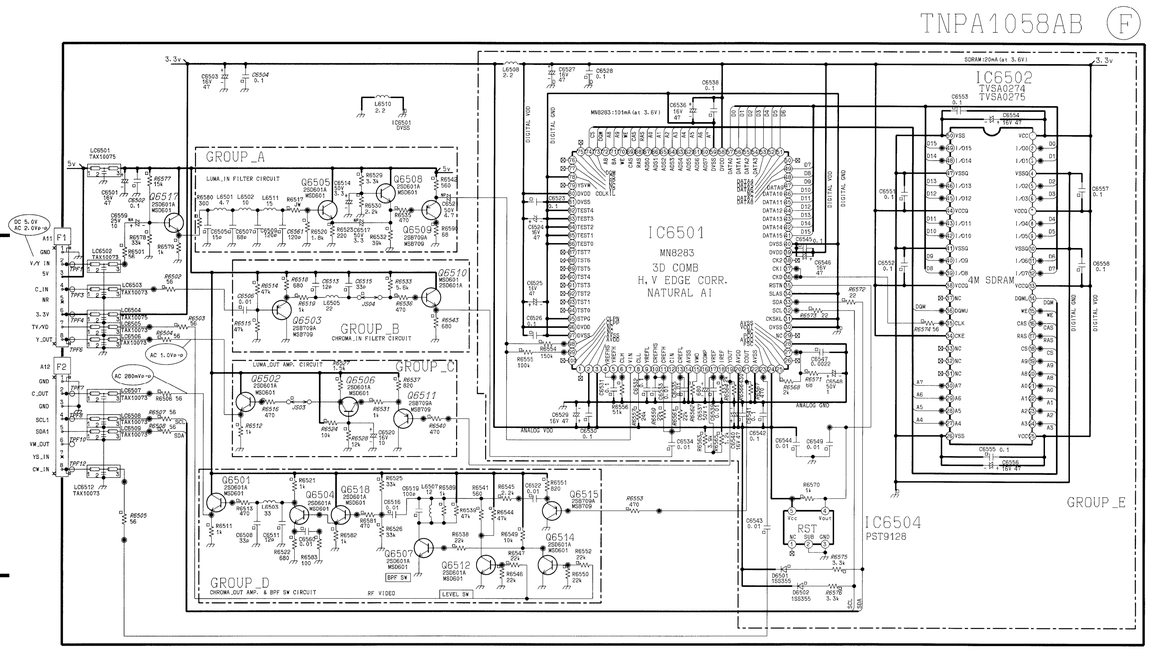
Waveforms - A-Board

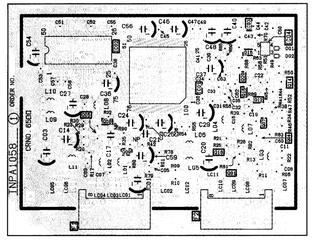

① A21-6 (TPS22) Video 0.98V p-p [25µs]
⑤ IC301-36 B-Y (Out) 1.72V p-p [25µs]
⑮ IC301-62 BLK 4.56V p-p [5∞s]
⑲ IC301-61 C-In (mix) 5.60V p-p [25µs]
㉖ A15-8 (TPS31) 0.42V p-p [20µs]
② IC301-52 Y-In 0.56V p-p [25µs]
⑥ IC301-35 R-Y (Out) 1.42V p-p [25µs]
⑯ IC301-55 H-Sync 2.8V p-p [25µs]
㉓ A15-5 (TPS27) Y-Out (P) 0.97V p-p [20µs]
㉗ A15-8 (TPS25) Comp/Y-Out (C) 1.00V p-p [20µs]
③ IC301-44 C-In 0.37V p-p [25µs]
⑩ IC301-57 V-Sync 2.92V p-p [20µs]
⑰ IC301-2 32fh VCO OSC
503KHz X'tal
㉔ A15-2 (TPV30) Y-In (mix) 0.86V p-p [25µs]
㉘ A54-12 V-Pulse 5.36V p-p [5∞s]
3.58MHz X'tal
④ IC301-37 3.58VCO OSC
⑬ IC301-13 V. AGC 3.36V p-p [5∞s]
⑱ IC301-7 H-Out 3.28V p-p [25µs]
㉕ A15-4 (TPS28) C-Out (P) 0.74V p-p [20µs]

F-Board Schematic

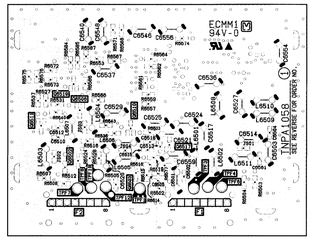


F-Board Layout - TNPA1058

Top



Bottom



Connector Voltages F-Board

Connector A11	Connector A12
1 .....0.00	1 .....0.00
2 .....4.65	2 .....2.63
3 .....4.89	3 .....0.00
4 .....3.72	4 .....2.54
5 .....0.00	5 .....2.46
6 .....3.31	6 .....0.00
7 .....0.00	7 .....0.00
8 .....2.68	8 .....0.00

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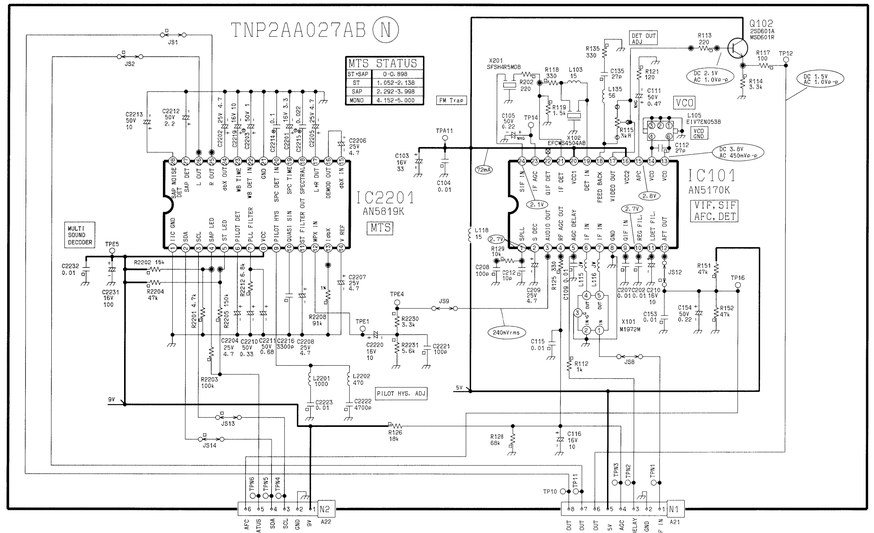
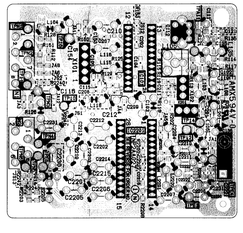
N-Board Schematic



N-Board Layout TNP2AA027



Voltage Measurements N-Board

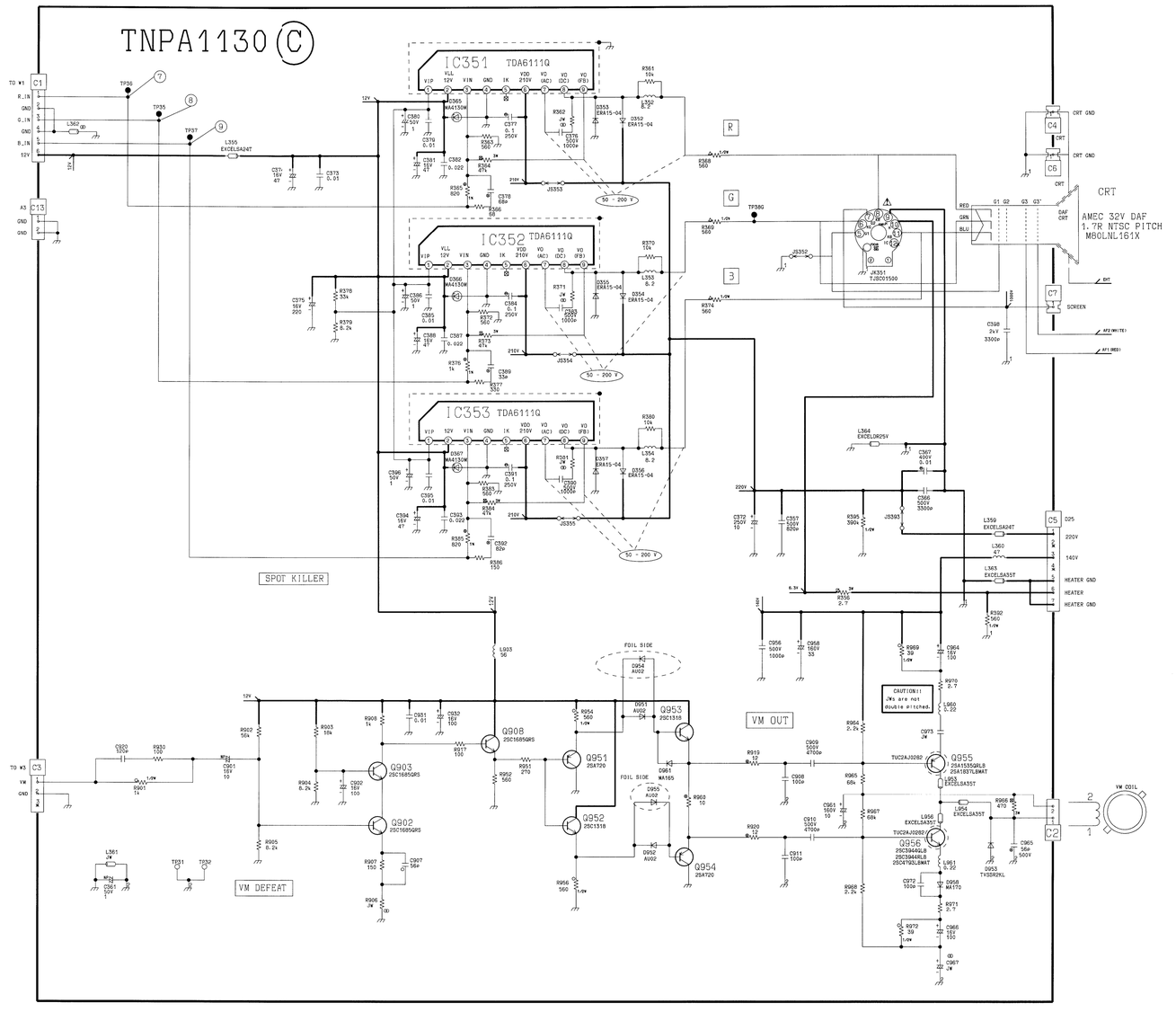
IC101			
1	2.11	13	3.51
2	2.01	14	3.51
3	2.12	15	2.75
4	2.29	16	4.85
5	2.41	17	2.03
6	2.59	18	2.03
7	2.59	19	1.92
8	GND	20	4.85
9	2.57	21	1.92
10	1.21	22	n.c
11	2.61	23	2.40
12	3.15	24	2.08

IC2201			
1	GND	15	3.92
2	4.30	16	4.50
3	4.28	17	4.51
4	2.08	18	4.52
5	0.07	19	0.60
6	4.85	20	4.51
7	2.73	21	GND
8	8.95	22	4.51
9	4.41	23	0.62
10	4.51	24	4.36
11	4.48	25	4.32
12	4.40	26	4.66
13	3.38	27	5.03
14	4.51	28	5.95

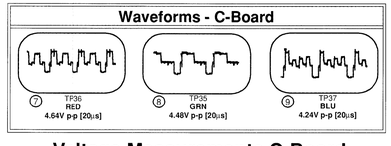
	Q102
B	2.03
C	4.85
E	1.44

Note:
The board layouts were modified to enhance and display traces otherwise hidden by a mask.

C-Board Schematic



Waveforms - C-Board



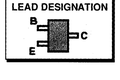
Voltage Measurements C-Board

IC351		IC352		IC353	
1	2.22	1	2.22	1	2.22
2	11.90	2	11.90	2	11.90
3	2.05	3	2.10	3	2.09
4	GND	4	GND	4	GND
5	n.c	5	n.c	5	n.c
6	213.40	6	213.40	6	213.30
7	151.00	7	165.60	7	164.40
8	152.60	8	167.40	8	165.40
9	149.70	9	164.40	9	163.00

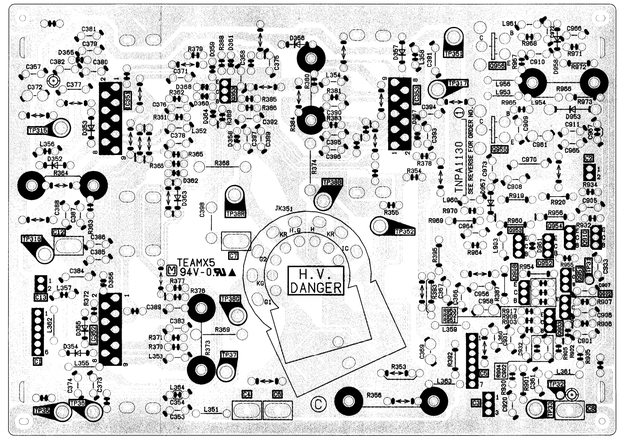
	Q902	Q903	Q908	Q951	Q952
B	1.37	3.60	7.20	7.17	6.53
C	2.95	7.20	11.80	GND	11.80
E	0.70	2.95	6.54	7.17	5.88

	Q953	Q954	Q955	Q956
B	6.56	6.54	138.00	2.22
C	11.80	GND	79.50	79.50
E	7.16	5.93	138.60	1.67

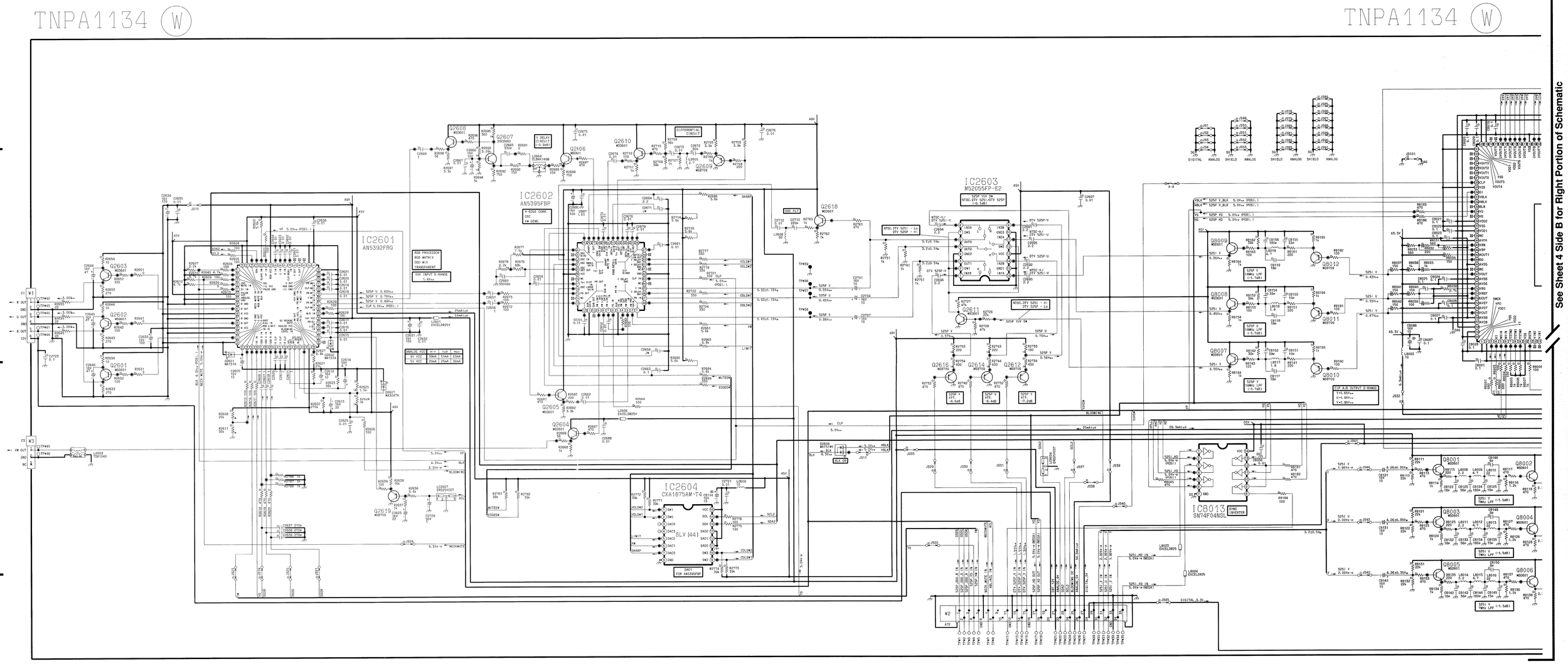
CHIP TRANSISTOR LEAD DESIGNATION



C-Board Layout - TNPA1130



W-Board Schematic (See Sheet 4 Side B for Right Portion of Schematic)



Overlapping Portion of Schematic

Schematic Notes

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in µH.
4. Test point indicated by ⏚; Test point but no pin ⏚.
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**, ⏚ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

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Boards Designation

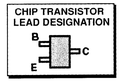
- A-Board - Main Chassis
- C-Board - CRT Drive
- D-Board - Power Supply
- E-Board - Main Power
- F-Board - 3D Comb Filter
- N-Board - VIF/SIF MTS Decoder
- V-Board - Protection Circuit
- W-Board - VIF/SIF MTS Decoder
- X-Board - I/O Interface
- Y-Board - PIP Controller

Voltage Measurements

1. Voltage measurement:
   - AC input to the Receiver is 120V.
   - NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter. Incorrect ground connection will result in erroneous readings.

CAUTION: ***Incorrect ground connection of the test equipment will result in erroneous readings.***

CHIP TRANSISTOR LEAD DESIGNATION

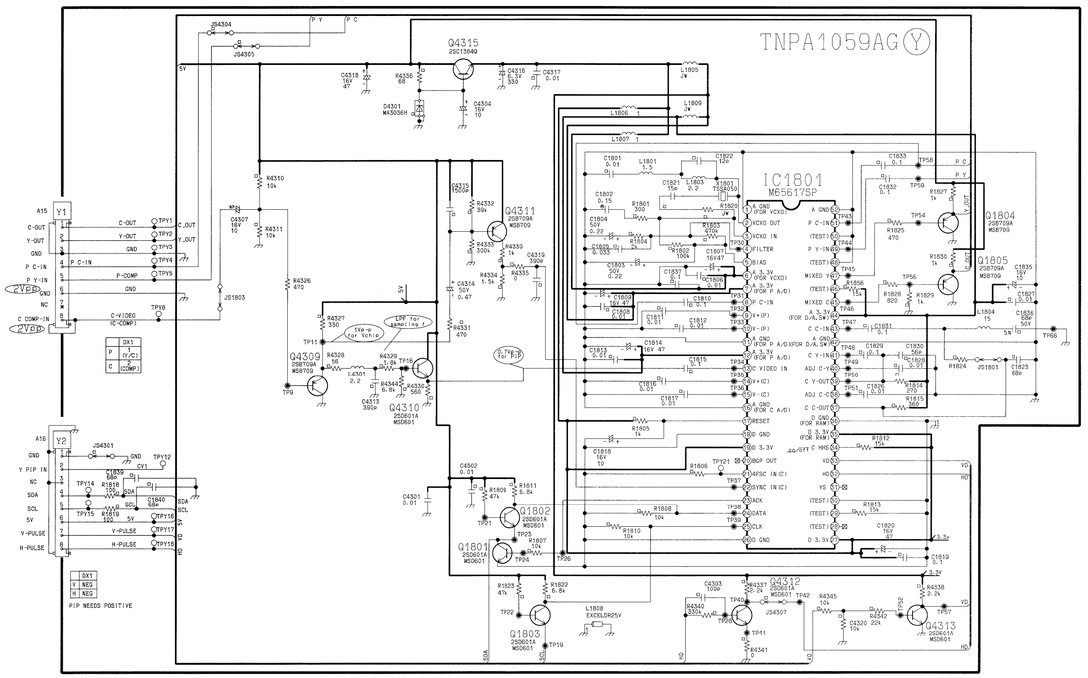


Connector Voltages W-Board

Connector A72			
1	0.00	19	0.00
2	0.00	20	11.91
3	0.00	21	8.99
4	0.00	22	2.60
5	0.00	23	2.60
6	0.00	24	3.35
7	0.00	25	4.88
8	5.19	26	1.98
9	0.00	27	4.93
10	0.00	28	3.30
11	0.43	29	3.30
12	0.00	30	3.15
13	6.20	31	3.15
14	6.10	32	3.16
15	6.22	33	0.00
16	0.00	34	4.80
17	3.93	35	3.44
18	3.80		

A | B | C | D | E | F | G | H

Y-Board Schematic



Voltage Measurements Y-Board

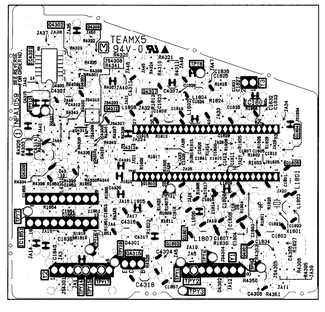
IC1801			
1	GND	27	3.28
2	1.42	28	n.c
3	1.60	29	0.00
4	1.60	30	GND
5	1.62	31	n.c
6	3.28	32	0.21
7	3.28	33	0.15
8	0.99	34	3.28
9	1.50	35	3.27
10	0.50	36	GND
11	GND	37	2.18
12	3.28	38	1.47
13	0.85	39	2.78
14	1.51	40	1.33
15	0.50	41	1.04
16	GND	42	GND
17	3.28	43	1.00
18	GND	44	3.28
19	3.28	45	0.97
20	n.c	46	3.28
21	0.01	47	0.96
22	0.23	48	GND
23	0.00	49	0.96
24	3.10	50	GND
25	3.10	51	1.00
26	GND	52	GND

	Q1801	Q1802	Q1803	Q1804	Q1805	Q4309
B	0.00	3.70	3.70	0.96	0.55	2.55
C	4.26	3.10	3.14	GND	GND	GND
E	GND	4.30	4.20	1.61	1.22	3.22

	Q4310	Q4311	Q4312	Q4313	Q4315
B	2.50	4.54	0.55	0.63	3.98
C	4.87	0.39	0.21	0.14	4.87
E	1.85	4.87	0.00	GND	3.29

Note:
The board layouts were modified to enhance and display traces otherwise hidden by a mask.

Y-Board Layout - TNPA1059



Schematic Notes

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
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6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
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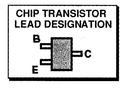
CAUTION: ***Incorrect ground connection of the test equipment will result in erroneous readings.***

CHIP TRANSISTOR LEAD DESIGNATION



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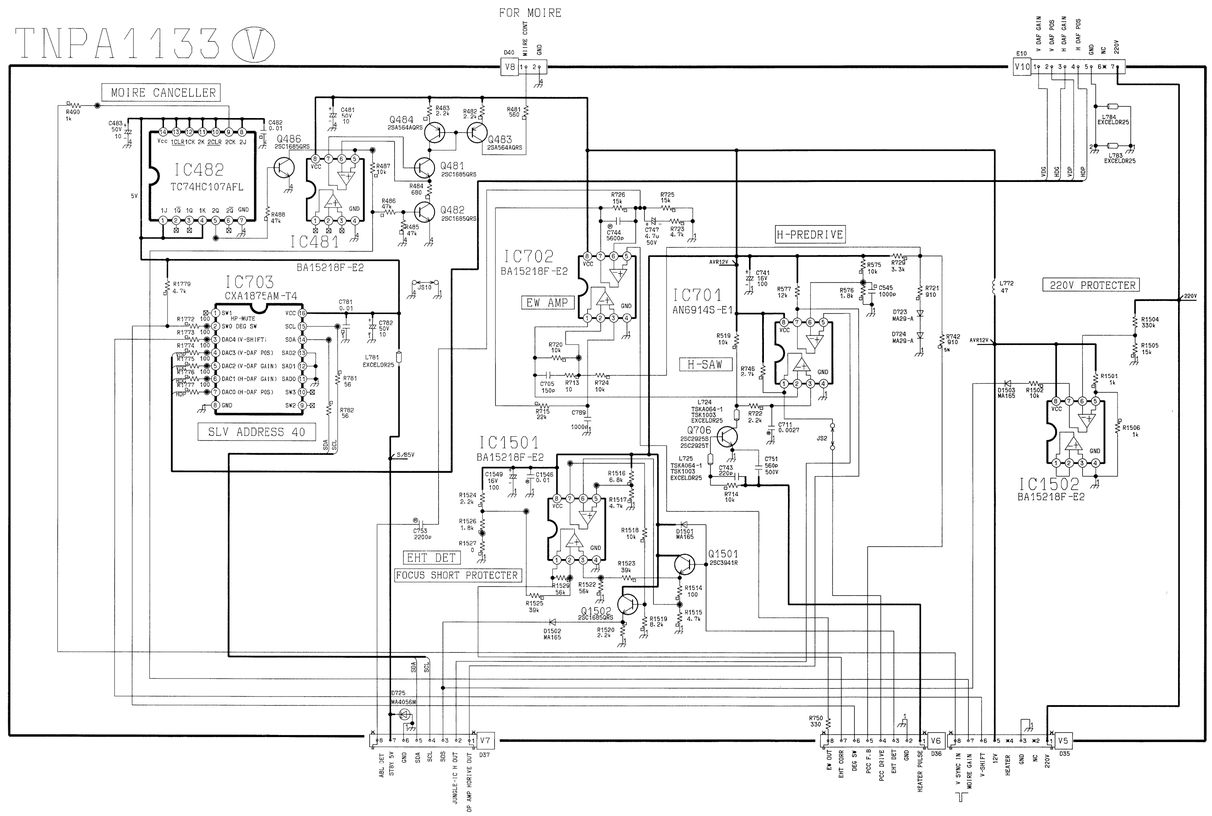
Boards Designation

- A-Board - Main Chassis
- C-Board - CRT Drive
- D-Board - Power Supply
- E-Board - Main Power
- F-Board - 3D Comb Filter
- N-Board - VIF/SIF MTS Decoder
- V-Board - Protection Circuit
- W-Board - VIF/SIF MTS Decoder
- X-Board - I/O Interface
- Y-Board - PIP Controller

V-Board Schematic



Voltage Measurements V-Board

IC481	
1	n.c
2	n.c
3	n.c
4	GND
5	0.00
6	11.40
7	11.70
8	12.00

IC482	
1	4.93
2	n.c
3	n.c
4	4.93
5	2.46
6	n.c
7	GND
8	4.93
9	3.80
10	4.93
11	4.93
12	4.93
13	4.93
14	4.93

IC701	
1	9.41
2	3.02
3	5.61
4	GND
5	1.61
6	1.83
7	0.39
8	12.00

IC702	
1	3.02
2	7.77
3	7.75
4	GND
5	3.88
6	3.87
7	7.76
8	12.00

IC703	
1	n.c
2	0.00
3	1.99
4	3.27
5	1.52
6	2.76
7	1.90
8	GND
9	n.c
10	n.c
11	GND
12	GND
13	GND
14	4.30
15	4.30
16	4.93

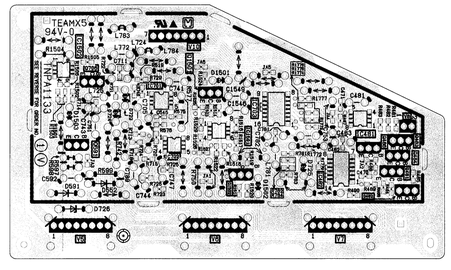
IC1501	
1	4.95
2	5.19
3	5.18
4	GND
5	5.01
6	8.62
7	1.25
8	12.00

IC1502	
1	11.60
2	11.63
3	0.00
4	GND
5	6.00
6	9.41
7	1.22
8	12.00

	Q481	Q483	Q486	Q1501
B	11.60	11.96	0.30	9.34
C	11.60	0.00	0.02	11.99
E	11.30	11.99	GND	8.75

	Q482	Q484	Q706	Q1502
B	0.00	11.72	- 3.21	0.56
C	11.32	11.70	5.56	11.99
E	GND	11.99	GND	0.02

V-Board Layout - TNPA1133



H | I | J | K | L | M | N | O

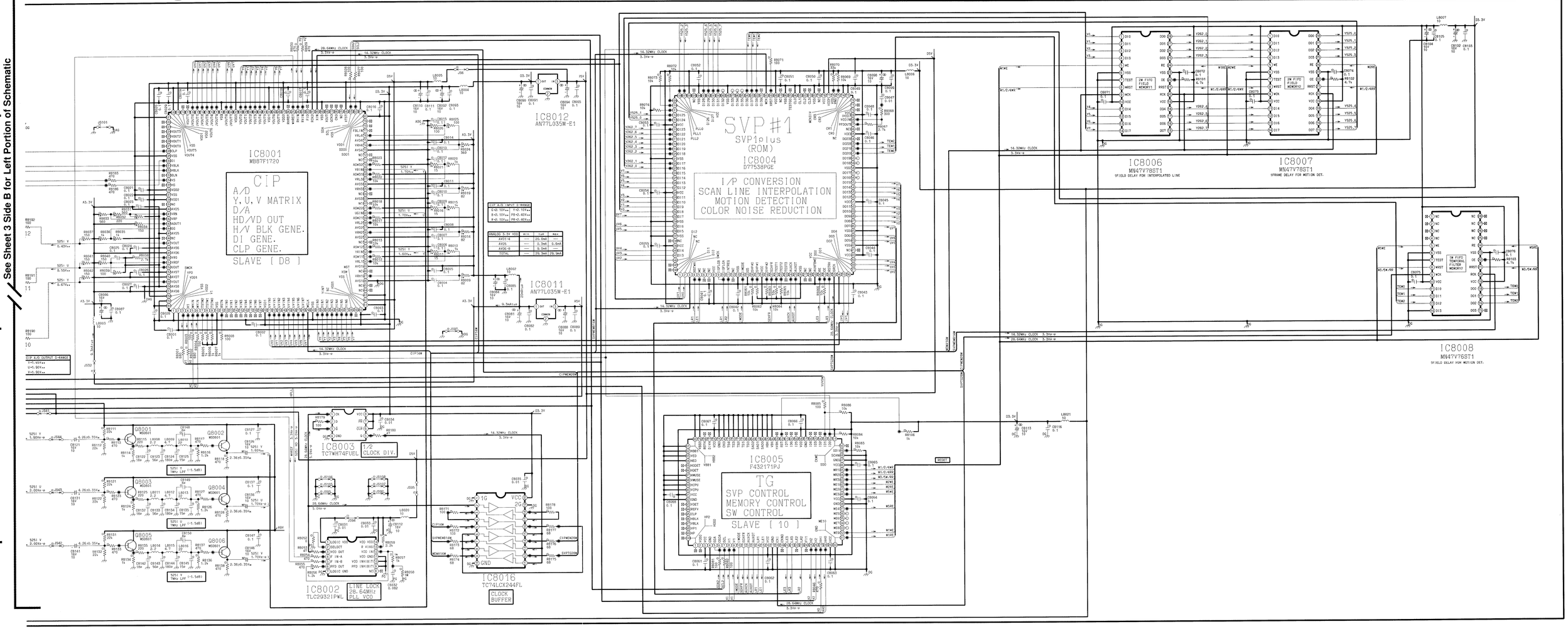
W-Board Schematic (See Sheet 3 Side B for Left Portion of Schematic)

1

2

See Sheet 3 Side B for Left Portion of Schematic

TNPA1134 (W)



3

4

Overlapping Portion of Schematic

5

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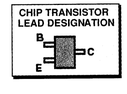
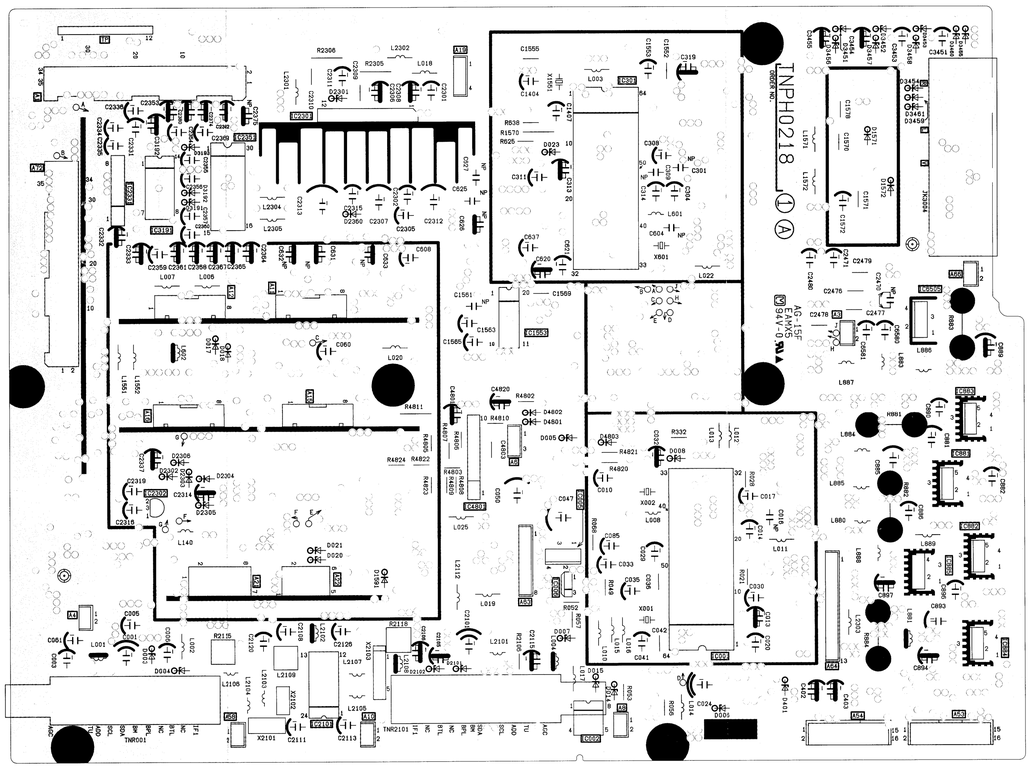
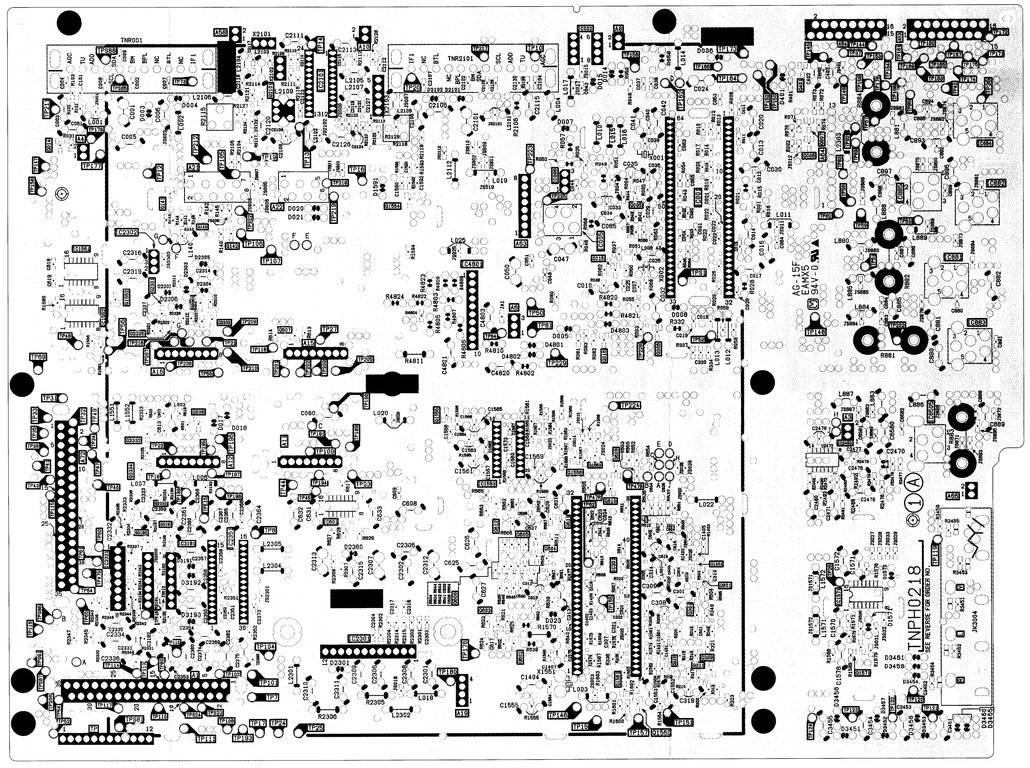


A-Board Layout - TNPH0218 (Top)

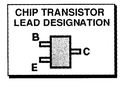


A-Board Layout - TNPH0218 (Bottom)



Note:
A-Board Schematic, Voltages & Waveforms on Sheets 1 & 2 (Side A)

CHIP TRANSISTOR LEAD DESIGNATION



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Note:
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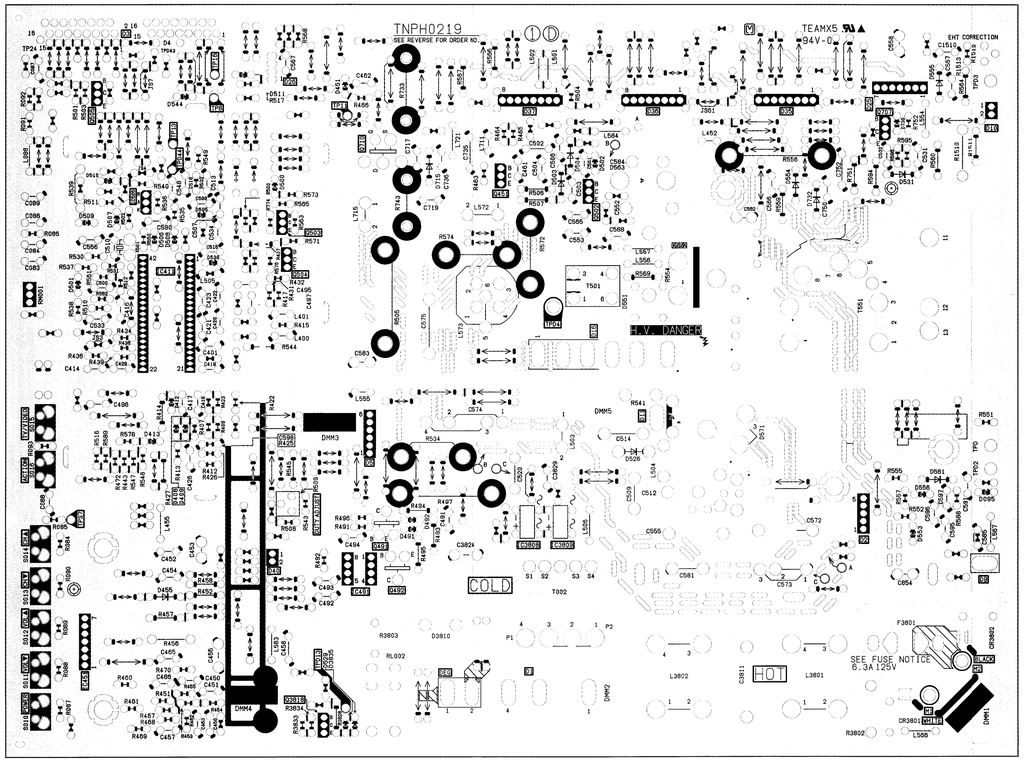
D-Board Layout - TNPH0219



Note:
D-Board Schematic, Voltages & Waveforms on Sheet 2 Side B

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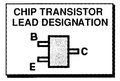

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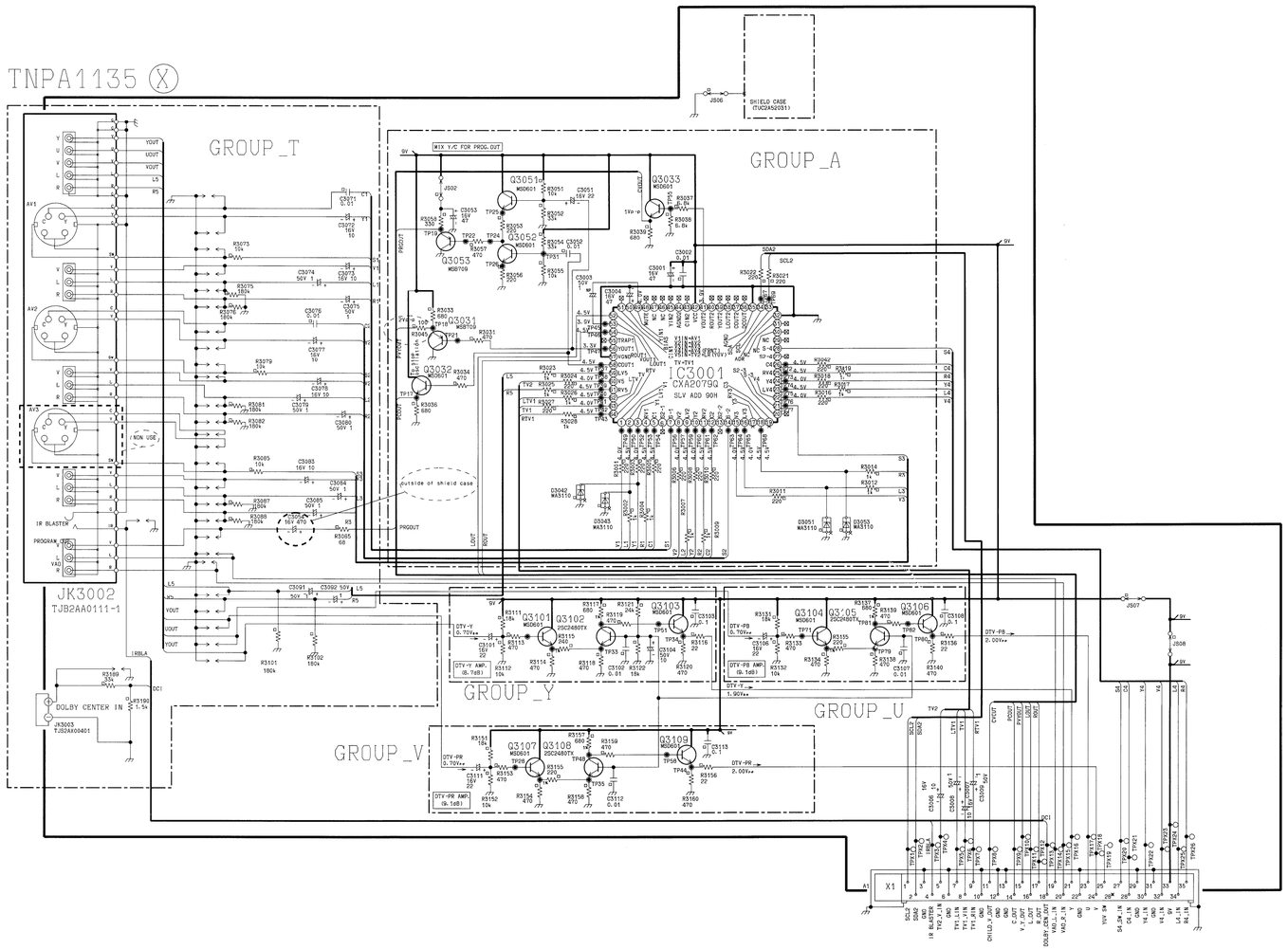
X-Board Schematic



Note:
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Voltage Measurements X-Board

IC3001			
1	3.92	33	2.60
2	4.45	34	2.60
3	3.92	35	GND
4	4.45	36	n.c
5	4.44	37	n.c
6	n.c	38	n.c
7	4.91	39	n.c
8	3.91	40	n.c
9	4.44	41	4.27
10	3.92	42	8.95
11	4.44	43	n.c
12	4.44	44	n.c
13	n.c	45	n.c
14	4.92	46	n.c
15	3.92	47	n.c
16	4.39	48	n.c
17	n.c	49	4.73
18	4.44	50	4.46
19	n.c	51	n.c
20	n.c	52	4.47
21	4.92	53	4.28
22	3.91	54	4.47
23	4.44	55	n.c
24	3.91	56	4.00
25	4.45	57	GND
26	n.c	58	4.35
27	0.13	59	4.44
28	0.00	60	4.26
29	n.c	61	4.44
30	n.c	62	4.44
31	n.c	63	4.26
32	GND	64	4.44

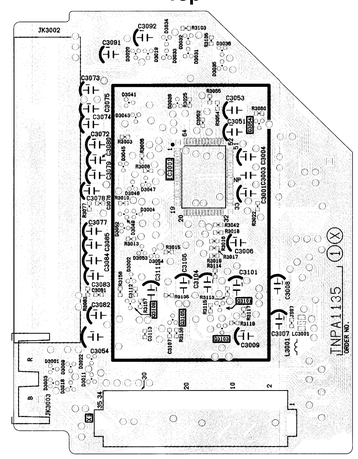
	Q3031	Q3032	Q3033	Q3051	Q3052
B	4.01	4.34	2.09	6.71	1.96
C	GND	8.95	8.95	8.95	4.78
E	4.67	3.71	1.47	6.06	1.31

	Q3053	Q3101	Q3102	Q3103	Q3104
B	4.79	3.04	2.79	6.91	2.98
C	GND	8.95	6.92	8.95	8.95
E	5.46	2.41	2.04	6.24	2.34

	Q3105	Q3106	Q3107	Q3108	Q3109
B	2.78	6.77	3.00	2.78	6.86
C	6.81	8.95	8.95	6.90	8.95
E	2.04	6.11	2.36	2.04	6.20

X-Board Layout - TNPA1135

Top



Bottom